

# PACIFIC DISCOVERY



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A JOURNAL OF NATURE AND MAN IN THE PACIFIC WORLD

# THE CALIFORNIA ACADEMY OF SCIENCES

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# A JOURNAL OF NATURE AND MAN **PACIFIC DISCOVERY** IN THE PACIFIC WORLD

Editor and Art Director: DON GREAME KELLEY • Managing Editor: ROBERT C. MILLER Vol. IV • No. 2  
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 ROBERT T. ORR, EDWARD S. ROSS (California Academy of Sciences) 1951

OUR SEARCH for a scapegoat on whose horns to hang a hideous sin invariably ends up where it starts—the editor's chair. Nor is the wilderness of Golden Gate Park vast enough for us to make good a symbolic escape. The author and photographer ("Three Voices of the night," *PD* Jan.-Feb. 1951, pp. 12-13) are clearly blameless. We can't make

## PRE-DISCOVERY

a charge stick on the owls, either, their reputation for cerebral eminence being what it is—no help for it, we'll take the rap. The screech owl is pictured on page 14, not 16; the barn owl on page 15, not 17. We're not even consistently wrong—cited them correctly on page 1... ¶Spring and fall are the desert seasons, as our Southwest authors know; but when "sumer is icumen in" there's no better region to turn to than our grand, green Northwest, where mountains, rivers, and forests stretch from the Olympic Peninsula to the Rockies. There are forests in this land where no ax rings, no bird nests, no winds arc green tops. These are "Groves of Stone: Fossil Forests of the Yellowstone Region," where the fossil forests are still standing, embedded in volcanic strata, layer upon layer. William B. Sanborn, naturalist-author with whom you will explore these Miocene groves next issue, has counted up to twenty-one successively buried forests, one surmounting another, in the northern Yellowstone National Park area. As the encasing breccia erodes away at cliff-side, their boles emerge, still standing as when the living trees were buried by volcanic debris.

The "Who's Who" of our scientific elite is a volume, nearly five inches thick in its current edition, entitled *American Men of Science*. Now the University of Hawaii's associate professor of anthropology, Dr. Katharine Luomala, may be entitled to a sly smile at the unintended proprietary exclusiveness of the second word in italics, above; nevertheless, she rates one of the longer entries in that biographical directory. Her "Logbook of a Voyage to the Middle of the Earth" is the robust, humorous narrative of a scientist afield, yet—pardon us, Dr. Luomala—it gains from the feminine touch... ¶When not curating the Academy's collection, the curator of entomology, Dr. Edward S. Ross, may be found prowling about his back yard with a camera. Since Dr. Ross' back yard is a chaparral wilderness reaching away from his doorstep to the summit of Mt. Tamalpais, in Marin County, other side of the Golden Gate from Golden Gate Park, he may get a shot at anything as strange as the "Mystery of the Huddling Bugs"—or more so... ¶This issue is making an unpremeditated bow to Marin, it seems. John Thomas Howell, Academy curator of botany who has neatly linked "History & Spring Blossoms," recently wrote a book on *Marin Flora*, so knows whereof he speaks about M. Woodbridge Williams' trio in Photo Center. And naturally Woody, whose home is Inverness on Marin's Tomales Bay, took the photos not far from his doorstep! It's a great place to live, we think... ¶That above-mentioned *American Men of Science* says Edmund C. Jaeger is head of Riverside College's zoology department; and that besides the "Desert Ironwood" his interests include, broadly, "ecology of plants and animals of arid regions; distribution of desert plants; taxonomy; forest trees; mollusks; philology." To be completely happy, it seems, one should have avid interests, then other avid interests in complete contrast to one's avid interests. We did not know Mr. Jaeger in the rôle of linguist, except that his pen spoke fluently and with firsthand knowledge of desert matters. His numerous books are doubtless the good friends of many *PD* readers. If not, try the new *Our Desert Neighbors* (Stanford, 1950)... ¶Stanford's professor of geography, Dr. C. Langdon White, concludes his "Chile: Nation With the Long Reach" on a note that marks his familiarity with the economy as well as the geography of his subject country. D.G.K.

## DISCOVERING PD'S AUTHORS

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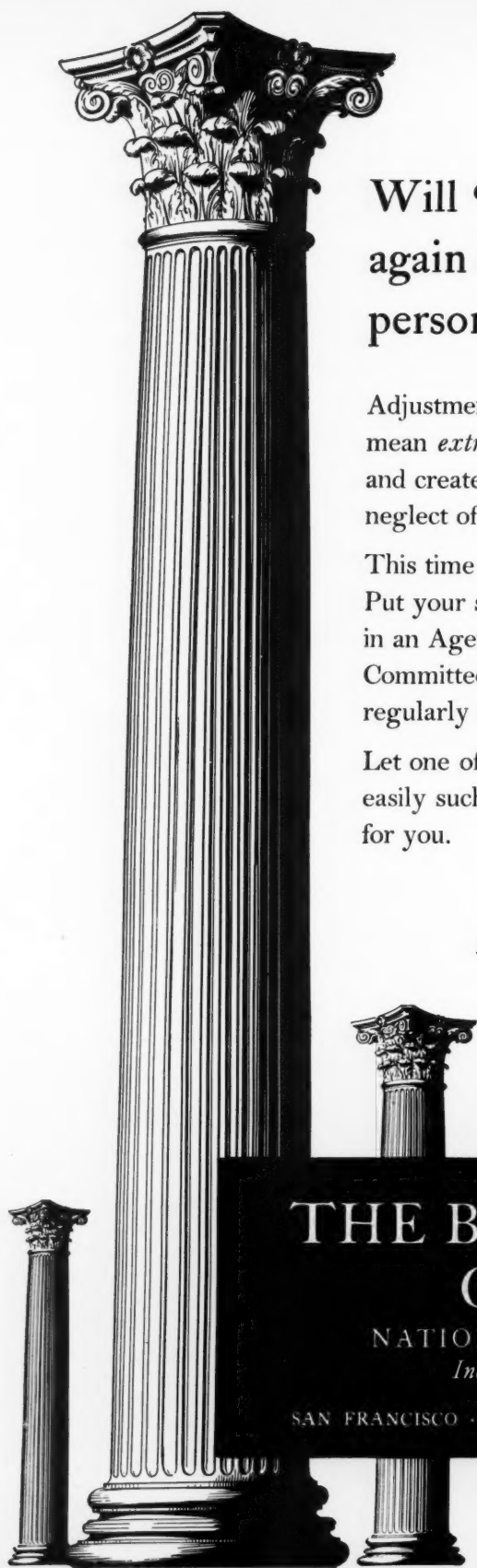


THE  
COVER  
COPY

Desert Primrose (*Oenothera deltooides*) and its companion, sand verbena, cover the dunes in early spring from Palm Springs to Indio. Don Ollis of Los Angeles has captured the delicacy of the primrose's large, fragile, white blossoms, if not their sweet scent—near Palm Springs in March.

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EMPLOYING, for reasons that may presently appear adequate, those cumbersome but occasionally useful devices, the third person singular and the editorial we, your correspondent addresses himself to the not unpleasant task of writing an editorial relating to spring. For reasons he hopes may also prove justified, he has selected as his particular topic, the moon.

On a warm spring evening in 1904 or 1905, the moon "walking in brightness" (*Job*, 31:26) first impressed itself on the consciousness of this writer. It was a Saturday night and, in accordance with an old American custom, the future editor — considerably lesser in both length and girth but, through the mystery of personality, only a smaller edition of the individual he is today — was being given a bath by his mother in the family wash-tub, which for this occasion was placed in the middle of the kitchen floor. For the benefit of any readers born thirty years too late, we may explain that baths were taken in the kitchen because the only source of hot water was a kettle on a wood-burning stove.

Your correspondent received his weekly ablution with about as much grace as a reluctant cocker spaniel. On this particular evening, having been duly and unwillingly scrubbed, he stood wet and dripping and rubbing the soap out of his eyes when a hitch developed in the orderly progress of events. His mother had forgotten to get a towel. She went upstairs to remedy this oversight, leaving her first-born briefly to his own devices.

The kitchen door was open, testifying to the warmth of the evening, and through it came the fragrance of apple blossoms, and subdued, enticing voices of the night. Your correspondent, without further delay, hightailed it through the open door and, finding a suitable spot in the garden, stood there — naked and damp and five years old — thoughtfully contemplating the moon.

This episode did not mark his earliest interest in nature, but is his first remembered experience of nature in the raw.

Golden moments such as this deserve to be timeless; but alas! they are always interrupted by cycles of events beyond our control. Mama having returned to the kitchen with a towel and finding no wet small boy to which to apply it, drew the obvious conclusion and followed her offspring into the garden. There ensued a flurry of feminine com-

ment of a type with which both sons and husbands are indulgently familiar. Something was mentioned about what the neighbors would think, and there were dire predictions of the probability of acquiring a respiratory infection, together with urgent exhortations toward an immediate course of action that would minimize both of these contingencies.

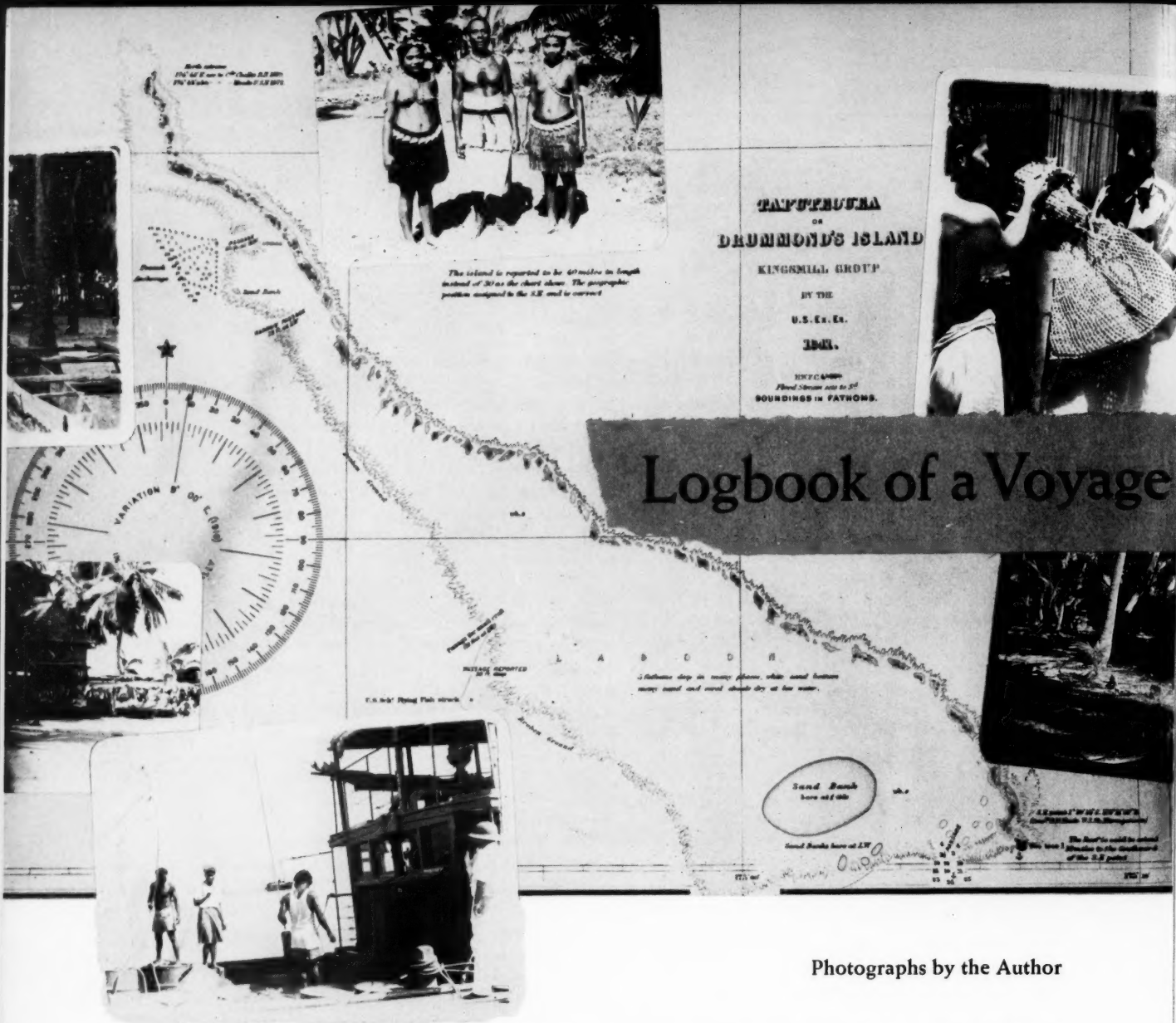
Your correspondent, not wishing to be a cause of further concern to a lovely lady who enjoyed his highest respect and affection, and being moreover aware that he had inadvertently created a state of tension which, if permitted to increase, might eventuate in a type of corporal punishment to which he was at the moment peculiarly vulnerable, abandoned his communion with nature and dutifully returned to the parental roof, swathed in a Turkish towel.

That evening and that garden are far away and long ago; but they survive in memory, and they exist, we believe, as universals of human experience. It is hard to imagine any sentient being who has not thrilled to the beauty of moonlight in a garden in spring.

Some considerable time after the events above recorded, we read the Rubaiyat of Omar Khayyam as translated by Edward FitzGerald, and had occasion to compare the several editions. FitzGerald worked his translation over and over through many years, and in some respects his final version is the best; but he never was able to improve the last two stanzas, and we quote the penultimate stanza from the first edition:

Ah, Moon of my Delight who know'st no wane,  
The Moon of Heav'n is rising once again:  
How oft hereafter rising shall she look  
Through this same Garden after me — in vain!

This passage inspires contemplation, but not necessarily melancholy contemplation. Although in a sense all contemplation of this sort is tinged with melancholy — "Tears from the depth of some divine despair Rise in the heart and gather to the eyes" — there is another sense in which such contemplation is both fruitful and inspiring. For we know that as long as the human race endures, small boys will gaze at the moon, dream their dreams, and — God willing — accomplish more than we to bring them to fulfillment. R.C.M.



## Logbook of a Voyage to

Photographs by the Author

ISOLATED AND LONELY though the Gilbert Islands may be, they are almost in the middle of the earth, for the Equator and the 180th Meridian (International Date Line) bisect on the eastern side of this straggling chain of sixteen coral atolls.

At the end of June, 1948, I flew to Suva, Fiji, to take the Royal Colony Ship *Kiakia* to the Gilberts, where, with a grant from the Viking Fund, Inc., and with the sponsorship of the University of Hawaii and the Bernice P. Bishop Museum of Honolulu, I was to make an ethnographical survey.

No professional anthropologists had worked in

the archipelago. The isolation and problems of transportation and communication had kept them from a group which perhaps about two thousand years ago had been a stopover for Polynesians moving toward a new home in the eastern Pacific.

Comparatively little has been published about the Gilbertese people and their customs. It is known, however, that they are predominantly Micronesian but with a marked Polynesian influence in the southern atolls as the result of later contacts with Samoa.

Politically today, the Gilberts constitute a British crown colony together with Ocean Island to

the west, the Ellice Islands to the south, and some scattered islands in the Phoenix and Line groups to the east. The colony is included in the scope of the Western Pacific High Commission, whose headquarters are at Suva. Colony headquarters are at Tarawa, which the U. S. Marines made famous.

During three weeks that the *Kiakia's* refitting was delayed, I purchased supplies and stowed away advice. One man familiar with the Gilberts recommended a large supply of sardines. "When

These cultural paradoxes had been visited by whalers and early voyagers including the Wilkes Expedition in 1841. None had a good word for the people or the few resources of the drought-ridden coral atoll. As on many Pacific islands in the old days, a native population mistreated and cheated by one ship took its revenge on the next ship. The village nearest the Tabiteuean anchorage used by the ships was burned down more than once by angry Europeans, including the Wilkes party. The choleric and quarrelsome Tabiteueans were also

## Katharine Luomala

you are lonely and can't sleep," he said, "it helps to open a tin of sardines and eat them." I bought plenty of sardines but they never helped me. As a matter of fact, the loneliness proved so deep and insidiously penetrating that I didn't even know what was the matter with me. Fortunately, nothing could keep me awake after dark on the island.

Which Gilbertese island to concentrate on was a problem. Old hands in Suva recommended Tabiteuea in the southern part of the group as the most primitive and culturally conservative as well as the most likely to be receptive to an anthropologist. It was good advice. Tabiteueans were helpful and friendly, and I came to admire their shrewd, independent, and proud spirit. If I were doing it all over I should still choose Tabiteuea but fewer sardines.

Popularly, Tabiteueans are called the Irish of the Pacific. To me, and perhaps the Tabiteueans of the Atlantic would agree, this is as silly a capsule description as any popular stereotype can be. According to the current song hit, "There's nuttin' like a dame." Well, there's nuttin' like a Tabiteuean either, not in the Atlantic or in the Pacific. It later turned out that at the moment they were being described as the most primitive in the archipelago, some of them, employed in the Ocean Island phosphate mines, were on strike for higher wages. Rumors flew that it was Communist-inspired.

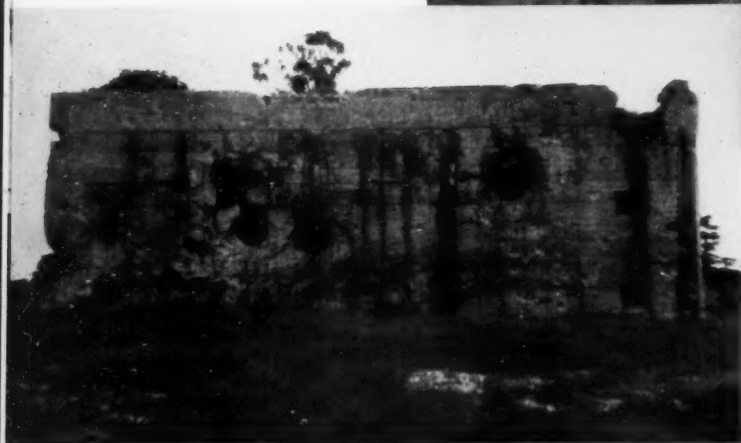
often at war among themselves, wearing tough, coconut fiber armor and helmets as protection against shark-toothed spears.

Besides food and which island to go to, my Suva advisers told me, without much conviction, about preventives of seasickness. A dour joy glistened in their faces that it was I, not they, traveling on the *Kiakia*. With morbid delight in anticipating my suffering, they heard me say that I had never been seasick, but—very true—also never on the *Kiakia* on the open sea. For my own pride and consolation in this unsympathetic atmosphere, I would remark that professional seamen had told me that even for good sailors there was always a first time.

Again, my adviser on the sardine question made seasickness loom as real as loneliness. He took me to see the ship, whose name is the Gilbertese word for the white fairy tern, but she was not in sight, having been taken out into the harbor for fumigation. He said, perhaps as much to himself as to me, for he too was going to the Gilberts on her, "Well, at least for the first couple of days at sea, the cockroaches won't swarm over your face while you lie in your bunk too sick to brush them off." My impression was that he did not mean I would be sick only a couple of days but that after that period the roaches would recover from the sluggishness caused by fumigation.

At last the day of departure came. At the wharf I looked about for the *Kiakia*. The orange-haired

*World War II left  
a dismal record of crime  
against man and nature  
in the Pacific World—  
Witness the ugliness  
of this row of  
acculturated shacks with  
backs to the airstrip  
on Funafuti in the  
Ellice Islands—*



*—or that hideous trophy, the famous  
Japanese blockhouse on Betio, an islet of  
Tarawa Atoll in the Gilberts, whose 15-foot  
walls withstood every form of assault  
until American flamethrowers made  
the strongpoint a horrible oven.*

Sikiana crew of a ship just in from the Solomons froze into poses as they spotted me and my camera, but they were not from the *Kiakia*. Then at the end of the wharf I saw the master of the ship and about him a miscellany of races in their variety of garb. Walking toward him to inquire about the ship, I noted for the first time the two masts and rigging projecting above the heads of the bystanders. Taking an empty space at the edge of the wooden platform I looked down. There she was—the R. C. S. *Kiakia*. Frankly, for a moment, but only a moment, I was caught in a confused rush of unanalyzable feeling. But she was going to the Gilberts and so was I. So apparently were the Ellice and Gilbertese deck passengers, the Sydney Silky puppy, the dozen black Orpington hens squired by a rooster, the innumerable tin cans of vegetation for the optimistic Captain's garden in Tarawa, and the many boxes including my supplies which had already been heated by the Captain with choice adjectives.

I learned before I got back from the Gilberts, however, that a two-masted auxiliary schooner, about 80 feet overall, is relatively pretty big.

There were three cabins—the Captain's, a passageway where the Mate slept, and the dining salon with a table about the size of a card table but with vicious edges that were to give me large black and blue marks which did not go away until I left Tabiteuea in December—on the *Kiakia* where I got some more.

At the table were four chairs. One chair, when occupied, bumped the smelly kerosene refrigerator except when it was up against the few stairs leading to the aft deck or against the washbasin. The second chair crowded the door to the Captain's cabin and a narrow cupboard. The third had space enough for the steward to get to the refrigerator if he walked sideways so as not to hit the bunk along the wall. This very short bunk was occupied by the other passenger, mentioned earlier, who folded up his length in it with his hair nestling on the glass and silverware racks at his head and with his feet squeezed under a radio shelf. The fourth chair bumped the bunk on the other wall.

When I showed a friend over the ship and pointed to this bunk as that reserved for ladies, he



exclaimed in horror, "My God! Where do you undress?" I had been briefed. Proudly I caught the blue curtain at one side and swished it across the rod over the bunk. We were silent. Obviously the curtain made a fine background for a shadowy strip tease.

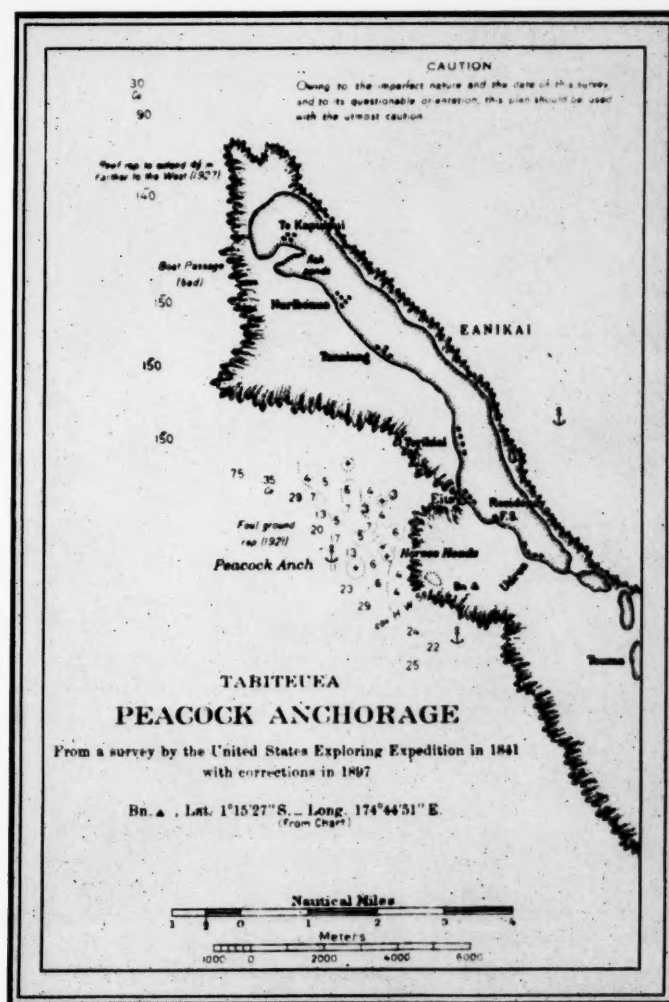
After a false start when we had to return to Suva for a few days because, to exaggerate, we had a mild case of shipwreck, having hit a sandbar in the harbor, we went north through the Fijis to Rambi Island. Here, for a few hours, I visited the Banabans from Ocean Island who had bought Rambi after phosphate mining had made their island uninhabitable. Their income from phosphate makes them among the wealthiest natives in the world. Older Banabans find money and beautiful, fertile Rambi no comfort in their homesickness for their infertile home atoll. But the young folks enjoy Rambi and dream of squandering the money when the colonial administrator's protective thumb slips off it.

Continuing north into the Ellices, occupied by Polynesians, we got lost and stopped off Nukulaelae atoll, the first I had seen and like most atolls made up of several islets. A small dugout canoe with outrigger, manned by two little boys, arrived. As my fellow passenger and I climbed in, he remarked, "These canoes usually tip over when they shoot the reef. Don't try to swim. Grab the canoe; otherwise you'll get swept under the reef ledge and get torn by the coral and perhaps eaten by sharks." Luckily, this good advice was unnecessary. In the evening we went ashore again; on our return, however, as it was stormy and rough, local officials replaced the little boys in the canoe. Nukulaelae housing is a conglomerate of thatch and tin in a variety of styles, laid out along clean, glittering coral roads. It is a brisk, lively community—that is, by comparison with Funafuti, the next stop.

I hope never to see a more dismal, repelling, and depressing island than Funafuti, headquarters of the European officer of the district. Its cheerlessness was accentuated by the absence of most of the people on another islet in quarantine against diphtheria.

Starting from its "downtown section" at a well-built stone pier and a brief strip of clean coral road, there is on the left the creaking, two-story wooden office building of officialdom next to a blindingly white Residence, complete with plumbing, a guest book, and a garden in which

sparse and spare plants struggle up among the coral pebbles. To the right is a thatch-covered canoe shelter, a Quonset hut or two for the store, and a dreary row of acculturated shacks. Around at their back is the grass-grown airfield with scattered junk heaps of tangled plane wrecks and a few battered coconut trees. Rusted metal revetments now house one or two pigpens. Circling back to the Residence along crooked, unkempt paths, one sees a few helter-skelter, untidy thatched huts and the native church. To repair war damage to the church, the people erected, in Rube Goldberg style, a winding ramp of planks to a second-story loft. This ramp, more hazardous looking than the Nukulaelae reef, would provide



an excellent test for anyone's sanity and sobriety. Just to believe one's own eyes would be the first stage of the test. Climbing it would be the second. Seriously, though, the structure is a triumphant and unique memorial to the energetic devotion of the islanders and their efforts to make the best of limited resources.

I could sympathize with the former official—his recreation was to take out his jeep after fortifying himself well with spirits and drive as fast as he could along the rough paths, dodging in and out among the coconut trees. At the time I did not care to join, but occasionally later on Tabiteuea at night as I stood alone outside the house, I would chart an imaginary course that even unfortified I would have been ready to follow.

Leaving Funafuti, we were plagued by more



*One of my Eita female "relatives" demonstrated the pounding of pandanus leaf (already dried and treated) to soften it before slicing into narrow strips for skirt-making or plaiting into mats. The prettiest woman in Tabiteuea, in my opinion, she put on her singlet for the picture.*

of the stormy, unsettled weather which had accompanied us for many days. The Captain decided to seek shelter at one of the northern Ellices, whichever could be found. As none was sighted, we stuck out a violent storm of thunder and lightning.

Not till months later when I left Ocean Island on a phosphate freighter for Nauru did I obtain an objective view of the *Kiakia* in motion. In my farewell look, I saw her pitching at anchor in the rough weather. She would lay her masts horizontally to the water on one side and then roll over to lay them cozily on the other. She probably looked the same out of Funafuti.

At some stages of the voyage, she would struggle to the top of a wave, hesitate shudderingly for a moment, then surf down or drop with a bump into the hollow. Here a devil would grab the ship in his teeth, shaking it in every direction before releasing it to climb the next wave and repeat the fun.

Once in the midst of trying to analyze the pattern, if any, of this motion, I hastily quit and sought the bridge. As I climbed up with the waves dashing at me, the Captain said, "Lucky you're a good sailor." This from Captain James Cooke, for such indeed is his name, is praise which I shall not tarnish by mentioning an occasional queasy chill.

It is still hard not to rave about the wonder of a small ship—particularly one with sails—on a boundless sea, the ocean of Cook, Quiros, Anson, and the others who also traveled in small ships. But when at last we had sailed past the southern Gilberts and arrived at Tarawa and the Europeans politely inquired what kind of trip it had been, faces froze if I talked in this way. The typical re-

sponse was, "Indeed?" It is said that to work for the Colony one must qualify as a poor sailor.

My few days on Tarawa before leaving for Tabiteuea included a visit to Betio, that islet on which the famous battle of Tarawa was fought. Perhaps other Americans would think as I did not only of the dead but of the sorrow and perished dreams of those left to mourn. Even the dead have left Betio and gone home now, for the remains in the cemetery have been removed to the United States.

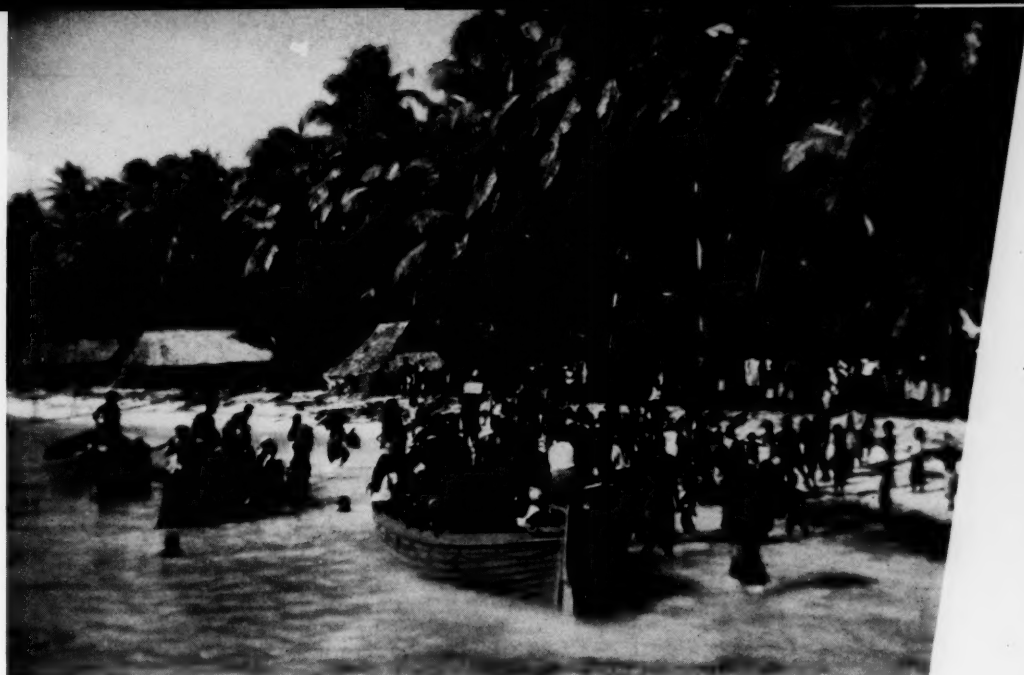
Retracing our way south, we stopped briefly at Nonouti Island. With some anxiety, the Captain saw me go ashore to look around. A colony official assured him I would be safe since I represented neither Government nor Religion. My sightseeing was limited, for the native officials requested that I photograph them and then cross-examined me as to my past, present, and future, and invited me to work in Nonouti.



*Tabiteuean laborers return from the Line Islands loaded with choice European goods they have bought with their wages.*

*Friends and relatives come by the hundreds from all over Tabiteuea to greet them, and perhaps size up their purchases with a view to doing some active bubuti (begging) later, which relatives cannot refuse.*

*The landing was between Eita village and the Government Station.*

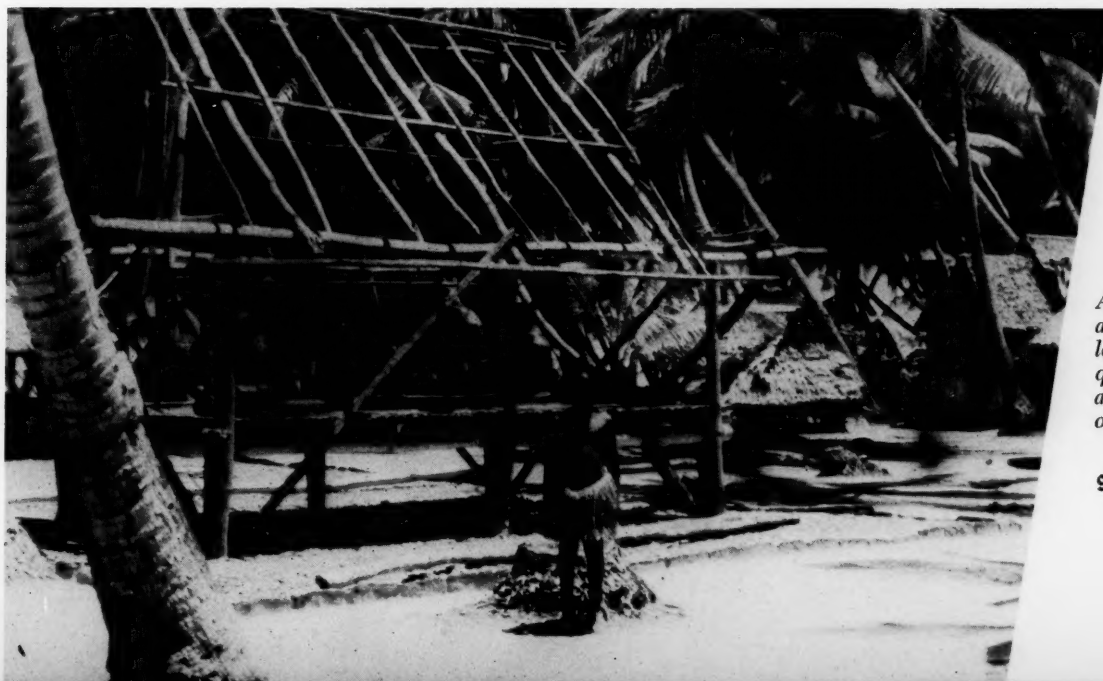


It was a short run south to Tabiteuea, a coral atoll with a volcanic population. Largest of the Gilberts, it is 30 miles long and a doubtful fourth of a mile at its widest. The length is broken into a slightly hook-shaped chain of 60 islets. That number multiplies in stormy weather when the Pacific on the weather side thrusts waves and spits spume over the land, fighting to make a permanent passage for itself across any shallow, narrow strip. An 18-foot wave, it is said, would be sufficient to sweep away the whole of the Gilbert and Ellice population.

The northernmost islet is the largest. A native described its length as "an hour's fast bicycle ride with no stops for smokes." Off this islet, opposite

Utiroa village, ships anchor some five miles out. Descriptions of this anchorage, though extremely critical, are amazingly restrained. I dare say, however, the brown stains in old journals are probably neither from foxing nor from tobacco juice but from the smoldering emotion with which the navigator pens his account.

Ship-to-shore travel is by outrigger canoe or Coöperative Society motor launch. The boat tosses and plunges in the purple waves outside the reef, then skims the coral heads which shimmer like oversized brown mushrooms in the lavender and green water, and finally grazes the sandy bottom. This is the signal to get out and walk toward the shore with its characteristic wall



*A new house for an Eita villager looks like a quick lash-up—and no headache over cost-plus.*



← It was easy to collect a crowd of Utiroa urchins on the village road under the breadfruit trees. There is a typical native house in the right rear, coconuts everywhere, of course, and probably a crooked papaia tree in the scene.

➤ One of my "adopted" mothers of Eita village brought me an ancient type of "favorite daughter" costume which only she knows how to make. She made it for me to wear at my nameday ceremony.

of coconut trees immediately behind a ribbon of white coral beach. In low tide it is a long walk. The natives pick up their feet and point them noiselessly and daintily into the water. The Europeans trudge and slosh slowly behind with clumsy, dragging feet and weary shins pushing a path through the water.

Within the hour, with my feet and skirt hem scarcely dry from the walk, I was precipitated into Tabiteuean tumult. The 4,000 people live in 17 villages which are split by ancient, inter-village rivalry and by intra-village differences among the pagans, Protestants, and Catholics. My cook and his wife, the laundress, were staunch London Missionary Society followers; my interpreter was the chief lay Catholic of the island; and the native magistrate was leader of the pagans and reputedly the outstanding magician. Alleviating the tension was the fact that the cook and the magistrate were from the same village, Eita, which is on the other side of the old No Man's Land, now occupied by the Government Station, which separates Eita from Utiroa. Being predominantly "LMS" and pagan, Eita has only a normal amount of internal conflict for Tabiteuea. It was the practice on certain matters for LMS followers and the pagans to form a moiety pitted against the Catholics.

This social fragmentation is intensified, not relieved, by each village's belonging to one of two

older moieties dating from the time of conquest by invaders from another island. Three villages, claiming not to have been conquered, reject membership in both moieties, but in a pinch tend to side with one of them. Further, villages form friendship bonds with certain others, one being spoken of as the father, the others as sons.

The council house or *maneaba* found in each village has a massive thatched roof resting on coral monoliths and shading a mat-covered floor, as much as twenty fathoms in length. The people sit on the floor. Each family has an inherited position, and the positions are ranked. The privileges and duties associated with the high ranking places are jealously guarded and reinforced by ancient traditions.

Many a time I returned from a maneaba on the verge of shell shock from the noise and fury of the arguments over these privileges and duties. Men shout the length of the maneaba, following accepted protocol on the order in which they may speak; dogs bark, children cry, and the women cackle with shrill laughter or make ringing, impromptu remarks, stinging enough at times to make the speaker gulp and sit down. Formal recognition of women's rights will add little to the authority already exerted by women from the sidelines.

Unlike Abemama Island with its dictatorial king made famous by Stevenson, Tabiteuea has



no chiefs. The name means Taboo-the-chief. *Tabi* is the euphonic form of *tabu*; *te uea* means the chief. Each village has instead a variable number of mature and honored men, the *Unimane* ("Old Men"), who wield authority. "An Unimane," one native told me, "is a man who always has something ready in his hand to give when the maneaba calls for it." That means industry, thriftiness, many relatives, and that personal quality of presence without which the other virtues decrease in importance. Superimposed on the old native government is the colonial, appointed hierarchy of magistrate, scribe, and other officials as well as the elected village representatives to the monthly court. Some of these men are also Unimane.

During my first week, the Eita Unimane asked to adopt me, with appropriate ceremonies in their maneaba, as their favorite daughter and to give me the name of Nei Marewen-Eita, meaning, literally, Lady Top-of-the-coconut-tree-of-Eita, or poetically, Lady Top-of-the-hopes-of-Eita. For once, the maneaba, though filled with several hundred people from several villages, was silent as the brief, two-piece skirt of dried pandanus strips and other elements of the favorite-daughter costume were placed on me and one of my new fathers walked slowly to the center of the floor and called to the spirits of the four directions to witness my adoption. Eita was motivated by the desire to use me as a prestige symbol in its struggle

—such was the ambition of every village—to be the leader of the 17 communities. The adoption proved, I hope, mutually satisfying. Later I had an interpreter from my village. Eita loyalty and strong sense of duty toward me became one of my most cherished psychological supports.

I had intended to concentrate my work on one village. Of course, Eita would have been ideal. But my plans had to be changed, for at the end of my first month the district officer arrived on a rare visit. Leaving the populous north free for his work, I went to south Tabiteuea for a month. It was a tedious, ten-hour journey on the launch which towed a heavy whale boat and an outrigger canoe. Who all the hitchhikers riding at my expense were I never learned.

Weeks later on the journey north I made sure that we did not transport any uninvited guests. Consequently, we made better time even though we had a long rest at Bangai village. The view across the interior lagoon at Bangai was, to me, the prettiest scene in a landscape which often appears tediously monotonous and ugly.

How beautiful, however, is the brief catalog of the elements of the Tabiteuean landscape! Ocean, sky, coral, coconut, and pandanus. But let us examine one, the coconut. It is usually a grotesquely distorted tree in Tabiteuea with a murky



This elderly Eita "relative" is plaiting a coarse work skirt of coconut leaves to wear when she works in the babai pits. Men also wear such skirts in the pits or when fishing.

*These Eita "relatives" dressed up for their picture with flowers and their best lavalavas.*



green top where many yellow fronds and dead brown branches droop ready to fall with a nut or two upon one's head. Sometimes after a day spent struggling with a foreign language and hearing English only in the limited, cultural context of island life, I would sit on the furthestmost extension of the wooden pier at the station and look at the heavy, dark blue, evening clouds massed after sunset low on the horizon in a semicircle about me. The sense of limitless ocean and the friendly twinkle of the first evening stars would bring a measure of perspective to a field life in which there is no real relaxation except in sleep.

Sparsely populated south Tabiteuea, with its numerous islets, is more primitive than the north. One southern Unimane said, "People up north say we are backward, but we have seen airplanes, and now we have seen a white woman."

Dangerous Nautilus Shoal, where whalers and other voyagers have been wrecked, discourages anchoring off south Tabiteuea. In the early days, crewmen who survived the wreck did not long survive the cannibals ashore. But on my visit, I found the southerners gentler, softer spoken, and

more uncalculatingly friendly than the sophisticated north embittered by unhappy contact with alien ships and the fighting among its own people.

My first evening in the south I was called to the maneaba to meet my relatives. So I was told. In the maneaba, lighted only by fires flickering outside the coral monoliths, were about fifty strangers, men, women, and children, who looked at me with such loving affection and open-hearted welcome that the caution and reserve which the competitive rivalry of the northern villages had created in me melted before they spoke a word. These Tabiteueans were not relatives from Eita, but fellow "Americans." They came, they said, from Amerika, a village of the south. They apologized for not having met the *Kiakia*. They added that they had only just heard that I was an American, and they had come at once and asked to see me even though it was late at night.

They told their story. Had I known it before I came to Tabiteuea I should have gone like a homing pigeon and done all my work in their village.

In 1944, during the war, a disabled ship out of

*Two men of Nikutoro village, south Tabiteuea, work at "feeding" the babai plant, several of which are planted in the same way in a great, deep pit, and represent an important part of native wealth. Roots of the plant are in brackish water and "fed" compost—there is no nourishment in the coral soil of an atoll.*





Pearl Harbor, a 90-footer, with 16 men aboard, beached on Nautilus Shoal after 31 days of drifting. Some of the men went ashore for help, as, in the past, other shipwrecked sailors had. How different was their welcome! The village Te Wai took the men in, assigning each to a family. Other villages, jealous of the prestige Te Wai was winning, tried to steal the men's affections and to spread calumny about Te Wai. It was in vain.

that the men arrived and on the date they reluctantly left, the 98 people of Amerika gather in the maneaba, wearing what pieces of European clothing they possess, laying out what canned food they can get, and eating with whatever cutlery they own. On those days, they eat and dress, they say, "American-style to honor the men because when they were with us they ate and dressed like us." On those two days, they give

*The view across the inner lagoon at Bangai village, south Tabiteuea, is one of the loveliest, I think, in all the island.*



For 34 days, Joe, and Jim, and Jack, and, "Don't forget Chico, Oh, that Chico," and the other twelve men whose first names are chanted now as in a litany, ate the fish, pandanus, coconut, and coarse taro which represent, except for a rare treat of pork, almost all the limited diet of Tabiteuea. The visitors were given the best. None realized perhaps from the kindly generosity that the island had sieges of drought and starvation. In honor of the boys, the village name was changed to Amerika. Each year now, on the date

speeches retelling the great story and wondering how the men are now.

You can guess with what reluctance and heart-burning I refused Amerika's invitation to spend the rest of my time with them and live in a little house near the maneaba. But I felt I should return to my northern headquarters, for now, with my short time already broken, the best plan of work seemed to be to spend my time getting a smattering about the ethnography of all the villages than to concentrate on one.

# Mystery of the Huddling Bugs

EDWARD S. ROSS

By early December the season of strong, westerly winds and fitful rain was well under way. People continued to rise at dawn to gather and preserve pandanus and to work in the large pits where *babai*, a coarse taro-like tuber, draws its life from the brackish water; from the compost of coconut-log rot, pandanus leaf trash, and dried, shredded weeds; and, most important, from the ritual application of the compost with secret, magical chants. The most faithful Christian believes that *babai* will not grow without secret magical treatment in this barren island which has neither soil nor fresh water.

The westerly season reached a climax on December sixth when at midnight in a violent storm the posts supporting my roof on the west side gave way and the roof moved several feet toward the east before it slid toward the floor, stopping miraculously a half palm's height from my head. I moved to a little native hut near-by, and three weeks later celebrated Christmas with my Eita relatives and a number of people from other villages who gathered at Tauma village for an informal singing meet. As the low, individual tables like breakfast trays were set out with cloth and little bouquets for the Unimane, who always ate first, the Eita chorus, the best in the island, sang. I ate when the Unimane did. Full realization of the honor swept over me that day, especially when the Eita chorus turned to us and sang its beautiful song of honor to the Unimane which my new interpreter had once composed.

Two or three days later, the *Kiakia* arrived to take me to Tarawa and Ocean Island so that I would reach the Pacific Science Congress in plenty of time. It was meeting in February in several New Zealand cities. A freighter was scheduled to leave Nauru for New Zealand, so after an overnight stay at Ocean Island, an Australia-bound phosphate ship dropped me off at Nauru. There, after a few days, the New Zealand-bound freighter arrived, but was re-routed to Ocean Island and I with her. Bad weather set in, preventing the loading of phosphate. After an unexpected stay of over three weeks at Ocean, I finally reached the Congress at Christchurch two weeks late. Then after a short stay in Auckland, twenty-four hours in Noumea to see the South Pacific Commission headquarters, and a breakfast stop at Canton Island, I was back in Honolulu ten months from the time I had left for the middle of the earth.

END

ON THE LITTLE LEAF PICTURED HERE is a thought-provoking situation. Near the base of the leaf rests a cluster of pearly-white egg shells from which insects have emerged by means of circular "escape hatches" still slightly ajar. Tightly massed near-by at the tip of the leaf are the escapers, now hardened and puffed up by the intake of air from the extraovular world. These are the first-stage nymphs of a species of stink bug of the family Pentatomidae. Perhaps they are relatives of those we may eat or taste inadvertently and with great regret while berry-picking.

The immediate question is: Why do these young bugs remain in a cluster—why don't they disperse as good little bugs should?

Let's have a few theories.

A psychologist might say this is a mere post-natal manifestation of prenatal experience. He would suggest that the young bugs have, buried in whatever we may call their subconsciousness, the "recollection" that they were once side by side in an egg mass and just can't get over the idea in a hurry.

A chemist would perhaps conclude that, in view of the fact that these bugs are shunned by many a potential enemy because of their offensive scent, they are clustering to exploit this advantage most fully. As a Hollywood Indian might say, "Small bug make'um little smell. Heap of small bugs make'um heap big smell. Ugh!"

A camouflage artist might decide that the young bugs en masse are trying to look like something else to insect-eating animals. Perhaps in this way they futilely hope to be protected from one of their important enemies, a fellow insect, that doesn't seem to mind their scent. This might be a wasp of the genus *Aestata* (Larridae) which, true to the selective faculty of most wasps, chooses prey of only one taxonomic group—some even hold to one species—to provision her nest of young.

Now any one of these theories could stand serious further consideration, but let us pass on to some complicating scientific facts. Reference to the literature reveals some strange factors that may bear on the question.

*The adult bug is about a quarter-inch long, shiny black with a reddish to orange pattern. This species, Cosmopepla conspici-laris, is frequently found on thimbleberry which they foul with their disagreeable odor by leaving a residue.*



*First stage: This is the curious situation the entomologist observed. Nothing unusual about a clutch of insect eggs on a leaf—but why haven't the newly emerged stink-bug nymphs spread out over the leaf?*

To begin with, it seems that these plant-juice-sucking bugs require special symbiotic bacteria to assist their digestion. These bacteria are retained in special side pouches or gastric *caeca* of the mid-gut wherein most of the digestive absorption takes place. When these bacteria have been experimentally withheld the bugs do not long survive.

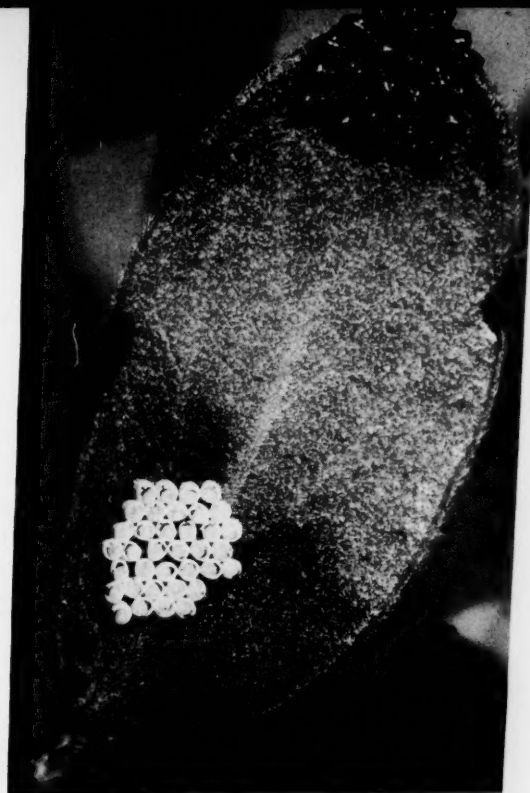
Although in some cases the bacteria appear to be passed from parent to young within the egg, in others it seems certain the young bugs get their supply of bacteria from the surfaces and interstices of their egg shells which have been deliberately contaminated by secretions of the bacteria-rich parent female. Upon hatching, the young nymphs lap up the secretion as their first meal and thus become supplied with the desirable microbes. Because of the possibly sporadic distribution of bacteria in the egg mass, perhaps the stocking of the guts of the brood in this manner is not yet universal. Perhaps the contamination is continued by close contact in the huddle you see in the picture.

During this first nymphal stage, or instar, the bugs take no plant food but continue to live on the egg yolk remaining in the gut. This period probably allows the newly acquired bacteria to multiply sufficiently for the day when the bugs will disperse to pierce plant tissue and begin feeding on vegetable juice.

It is obvious that these facts and speculations may not explain this strange huddle. They do, however, give a hint of the complexity of a problem such as this, and provide a mere sample of some of the strange physiological activities and relationships developed by insects in their long and successful life on this planet.

END

Photographs by the Author



▲ *Second stage: Teased into activity, the bugs disperse but soon reform their huddle. This clumping is common in other species of the Pentatomidae and related families and is often continued in later stages.*

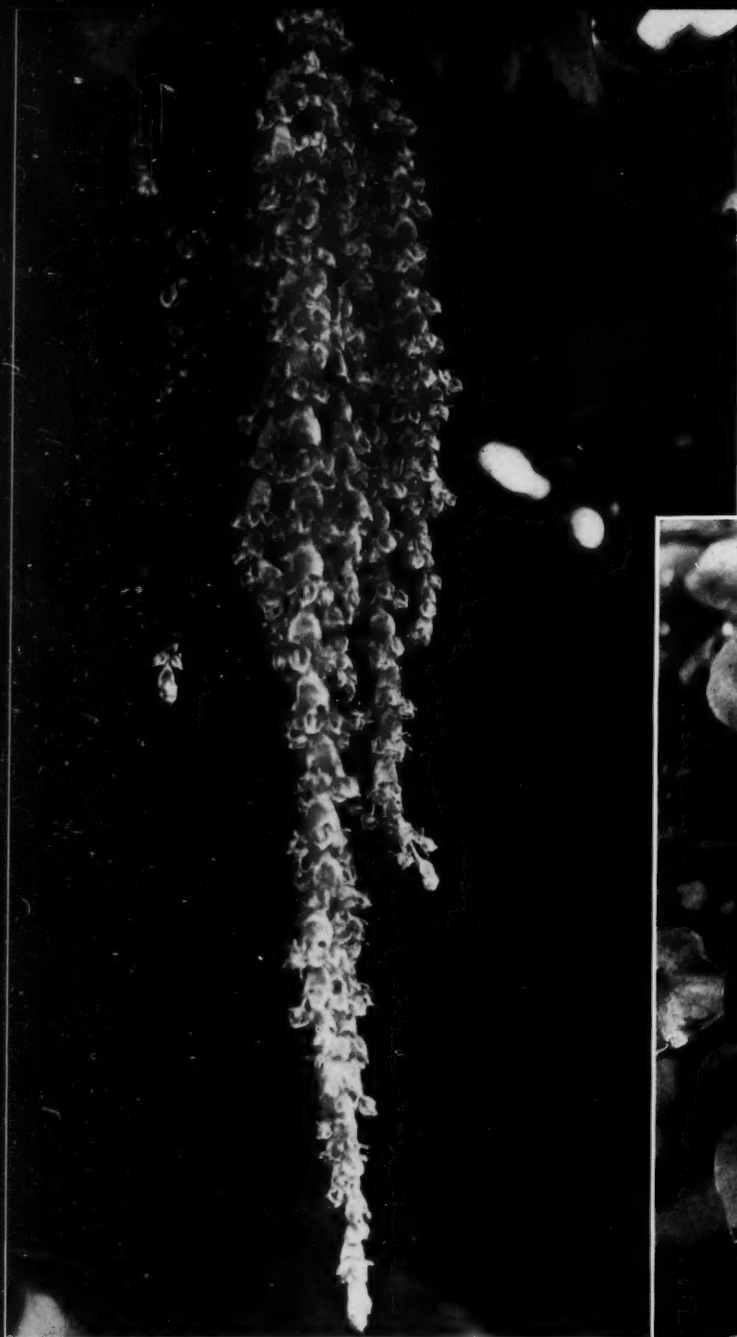
15



JOHN THOMAS HOWELL

## HISTORY & *Spring Blossoms*

Photos by M. WOODBRIDGE WILLIAMS



♣ Male flowers of the silk tassel bush.  
(All three photographs were taken in  
Marin County, California.)

➤ Miner's lettuce has  
tiny blossoms.



➤ Star-flowers show bright pink  
on moist woodland slopes

## PHOTO CENTER

THE THREE FLOWERING PLANTS so attractively depicted by Woody Williams' photographs have little in common botanically, except that phytogeographically they are not uncommon natives along the central western edge of North America. Historically, however, the three are to be counted among our western plants discovered during the geographic and scientific exploration of the "Northwest Coast" by the British, when intrepid navigators were nosing their way along the rugged coast and courageous trailsmen were tracking the vast wilderness eastward past the Rockies.

The first of this trio to be discovered and named was miner's lettuce (*Montia perfoliata*) which was collected by Archibald Menzies, physician and botanist on Vancouver's voyage of exploration to the west coast of North America during the years 1792 to 1794. It is the most widely distributed of the three plants, ranging from British Columbia to northern Mexico and east to Arizona and central Nevada. The Indians esteemed it as a potherb, pioneers used it as salad greens, and even yet a tasty salad may be prepared from the rather succulent herbage. The plant is very common in moist places in the valleys and hills west of the Sierran-Cascade crest.

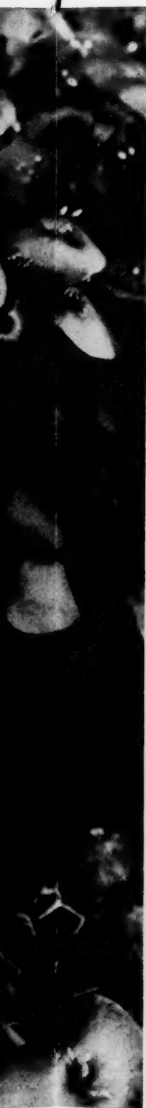
The quinine bush or silk tassel bush (*Garrya elliptica*) is not so common, a shrub found on coastal hills of Oregon and California. It was discovered by David Douglas, botanical explorer on the West Coast between 1825 and 1832, and was named by him for his

friend, Nicholas Garry of the Hudson's Bay Company. This genus is characterized by the arrangement of its peculiar flowers in catkins. Just as in the willows, the flowers of which are also borne in catkins but to which *Garrya* is not at all related, the catkins are either male or female and each kind is restricted to a male or female plant. The male or staminate catkins, a cluster of which is here shown, are much the more attractive of the two with their graceful clusters of buff or cream-colored flowers and bracts, sometimes tinged with gray or lavender. These are frequently in full bloom before the end of January.

In contrast, the delicate star-flower (*Trientalis latifolia*), which is a member of the Primrose Family, is one of the flowers to bloom in the late spring in May and June. At such times, its bright pink corollas, about a half inch across, are a happy sight on shaded woodland slopes and may be watched for from central California north to British Columbia. We owe the discovery of this attractive plant to Dr. W. F. Tolmie, a medical officer in the Hudson's Bay Company, whose original collections of the plant were made "about Fort Vancouver" and on the "Walla-wallah River." It was Tolmie who, in 1833, made the first botanical collections on Mt. Rainier.

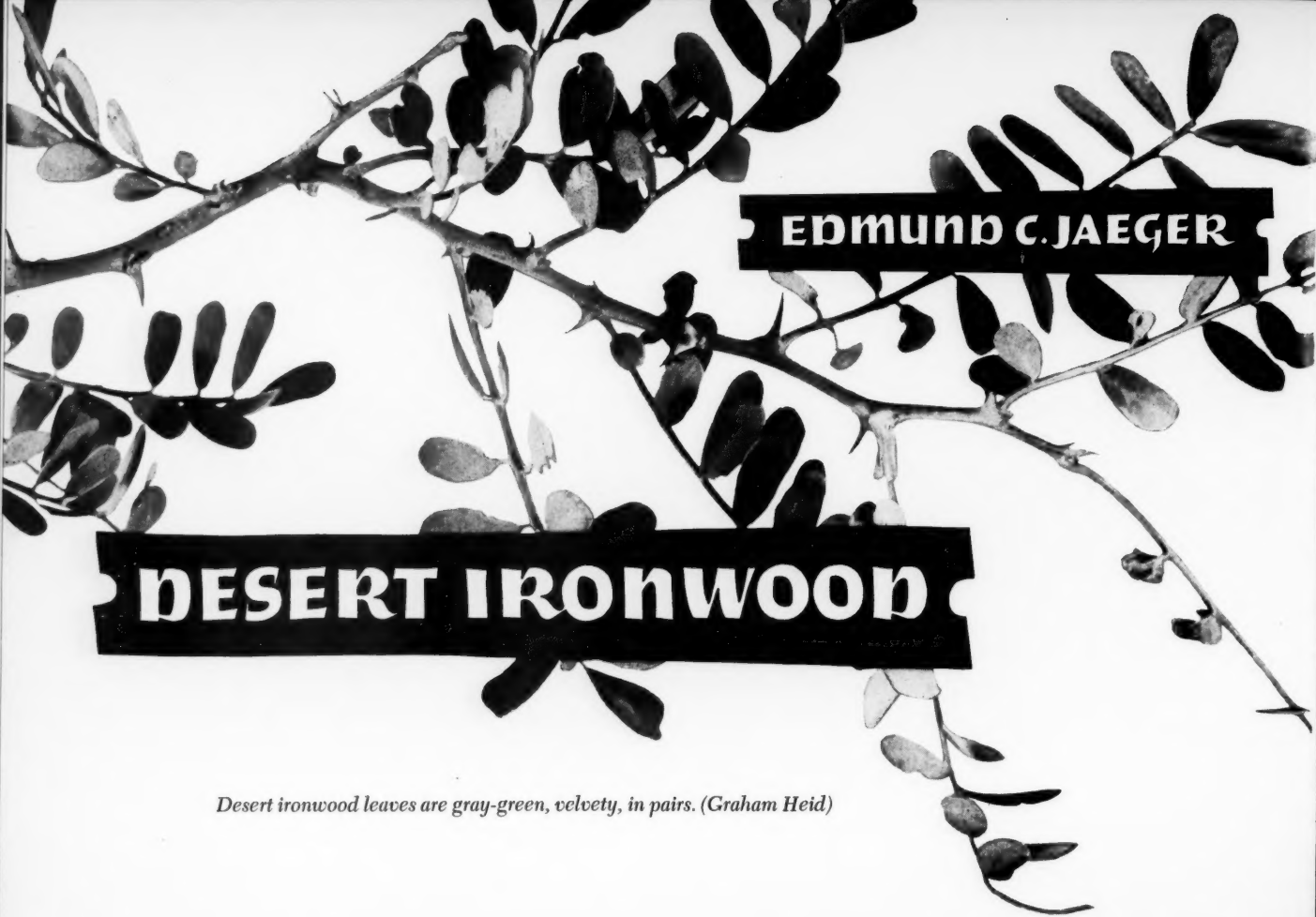
Many of our wild flowers, like these three, are not only of interest botanically and esthetically, but also have historic connections that are reminiscent of the time when the West was really wild.

END



show bright pink  
woodland slopes.





EDMUND C. JAEGER

## DESERT IRONWOOD

*Desert ironwood leaves are gray-green, velvety, in pairs. (Graham Heid)*

IN FAR WESTERN and southern Arizona, southeastern California, northwestern Sonora, and part of Baja California is a land of rock and desert with natural gardens of rare and beautiful plants. As arid gardens, these of the American Southwest are rivaled in few parts of the world. In summertime these areas are somewhat uninviting because of the great heat and intense light, but in autumn, winter, and spring few places hold greater appeal to the lover of the wild. Day follows day of glorious mellow sunshine; night-time temperatures are cool but never really cold. Best of all it is, up to this time, an area sparsely populated, where the works of man detract little from nature's beauty.

This is the domain of the saguaro, or sahuaro (rather rare in California), the ocotillo, and the most regal of desert trees, the beautiful, spinescent desert ironwood, known to botanists as *Olneya tesota*. For the most part it is a tree that clings to the borders of gullies and arroyos and sand washes. Several of our desert trees are al-

most leafless during the fierce heat of summer, but the gray-barked ironwood which seems to rejoice in heat retains a gray-green cover of leaves throughout the year, giving welcome shade in generous amount. In balmy weather it seems more beautiful than ever, and in very early summer it comes to a climax of loveliness when myriads of small, deep blue or violet-purple, pea-like flowers borne in clusters grace almost every upper leafy branch. It is after the flowers fade that the old leaves begin to fall off and new ones come on to take their place.

Young trees have the main limbs growing strongly upward, but as they get older the branches—especially the older ones—begin to droop, giving the trees a rather unkempt appearance. Not long are the young trees spared the molestation of the ironwood's archenemy, the leafless desert mistletoe, *Phoradendron californica*. It is a common thing to see three or four of the large, dark green mistletoe clusters in a tree only a few years



old. In mature trees eight or ten or even more of the semiparasitic plants may be lodged on the branches sucking away the sap. In the meantime they have induced considerable deviation from normal growth habits and in the very form and appearance of the tree. Eventually they may cause its death.

Some of the strangest sights one sees in our southern arboreal deserts are the tumorlike malformations caused by the mistletoe on the main trunks and branches. Some of the huge swellings weigh several hundred pounds and are as large as barrels; some of the small, more plentiful ones are no larger than tennis balls and weigh but a pound or two. In any case the forms are as varied as one could imagine—from narrow spindles to fat, irregular contorted lumps or globes. Where the infestation of mistletoe is severe, ten to twenty of the tumors may be in process of growth in a single tree. Some of the large malformations must be long in reaching their maximum size, being almost as old as the trees themselves.

These mistletoe tumors are not very noticeable as long as the tree is in good health and the semiparasitic plants are actively growing and providing a generous cover of green; but when injury to

the host has progressed to the point where the well-being of the tree is seriously affected, and both parasites and host begin to die, the great size of the woody swellings becomes apparent. The tumor shown in the illustration was 44 inches long and 52 inches in girth. The largest malformation I have ever seen was in an ironwood tree in the Chocolate Mountains of California's Colorado Desert. It was five feet, two inches long and seven and one-half feet around!

The outer bark covering the tumor develops large fissures and the tissues below appear "irritated" and swollen; the bark itself becomes dry and scaly or breaks up into coarse shreds. When the woody mass beneath is sectioned, the intricate network of "suckers" which penetrate the wood to feed the parasite and induce the rapid and abnormal proliferation of wood cells is at once apparent. There is always a considerable amount of pithy wood present within the swollen mass, and when the tumor and the branch which bore it die this pithy tissue may break down, leaving cavities of considerable size within. Where these caverns are large and open to the exterior, wood rats (*Neotoma*) often take advantage of the protection they afford and build their nests within, filling them up



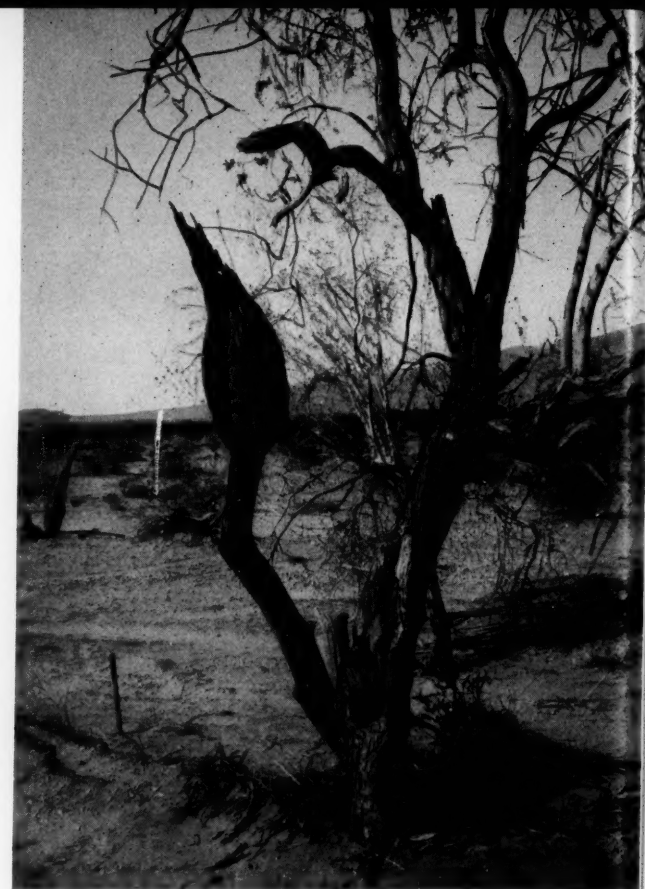
with quantities of debris ranging from chips of ironwood bark to old bones and other refuse.

Occasionally one sees small tumor-like swellings in other mistletoe-infested trees and shrubs, most of them so small they are scarcely noticed. Once in a great while I find a small spindle-shaped one on a creosote bush stem or catclaw branch.

It might be in order to point out that no plant of our deserts is so badly infested with the mistletoe as the ironwood tree. The honey mesquite comes next, then catclaw acacia and screw bean and palo verde in the order named.

Probably it is the rough bark of the ironwood and mesquite which encourages the growth of mistletoe by offering ready lodging places for the seeds. The desert bird called the phainopepla is probably the great "planter" of mistletoe seeds. The white or pinkish-white berries are one of its principal and never-failing foods. The seeds with much of their protective mucilaginous covering go through the bird's digestive tract unmolested and are often dropped by the bird in the trees where it feeds. At times we see large masses of the mistletoe seeds below oft-used perches and roosting sites. Once the seeds have lodged in the bark crevices they stand at least a fair chance of sprouting and growing into a mature plant. That more do not grow is still a mystery.

Although the ironwood trees seem to offer ideal sites for the nests of a number of desert birds, singularly few birds except the phainopepla and the verdin ever build in them; and the phainopepla appears to be attracted mostly by the mistletoe which offers shelter for the nest, and by the berries, which provide its ever-present food supply.



Occasionally, but not often, the desert ladder-back woodpecker drills into the outer soft wood of ironwood for fat grubs of wood-boring beetles but seldom, if ever, to make a nest cavity. The inner dark brown wood is evidently too hard. In the winter season the long-eared owl often finds daytime shelter among the upper leafy branches of the ironwood, and at night one may hear the soft cooing or whining notes as the birds are out on silent wing hunting up and down the sandy washes for their rodent prey.

But while most woodworking mammals and birds shun the durable, hard wood of *Olneya* there are plenty of larvae of beetles that do not. When the softer-wooded young branches die or are broken off by winds, as occasionally they are, ironwood borers quickly consume them, the cellulose that is passed through the insects' bodies emerging as a spongy yellow powder or frass to be packed in the galleries the stout-jawed borers have left behind them.

The wood, particularly that of the main trunk, when unmolested by parasites or disease, matures into a deep brown material of exceeding hardness,

*Olneya tesota*. a. leaf with stipular spines; b. flower branchlets; c. calyx spread open; d. pod.  
(From *A Manual of the Flowering Plants of California* by W. L. Jepson, new edition, 1951, University of California Press)



breaking more quickly under the blows of a heavy maul than yielding to the sharp ax or the hard steel saw. The wood burns slowly but with an output of great heat and a strange-smelling, somewhat acrid smoke. After reduction to "coals" the hot embers, when smothered in their own ashes, last a long time, even as long as eight to twenty hours—for ironwood coals have seven lives. The gray, powder-fine ash is rich in silicon.

At times the green ironwood trunk exudes a gelatinous to gummy sap of reddish color that is sweet and with a pleasing wine-like taste. Both hummingbirds and bees are attracted to it.

The desert ironwood is a rather prolific seeder. The hard, brown, rounded seeds, borne in somewhat elongate, several-celled pods, are showered when ripe upon the sand and gravel. Those that are not buried by cloudburst waters, which at times race in late summer down the gullies and washes where the ironwoods grow, are eagerly picked up by rodents to add to their underground stores of food. Ironwood trees growing away from the washes on hillsides and rocky stream benches doubtless owe their position to the provident work of these rodents. Many seeds sprout but few of the seedling trees withstand the desert drought of summer. The larvae of a small brown and black bean weevil, *Mylabris pruinus*, are known to work in the seeds. The adults feed on the flowers and pollen.

In certain parts of its range, *Olneya's* leaves are sought by myrmicine leaf-cutting ants, *Atta* species. Occasionally one comes upon thousands of these diligent ants moving across the wash sands in long lines, each one picturesquely carrying over its back like a sail an ironwood tree leaflet. The formicary or ant dwelling-place is generally found in the side of some clay or gravel bank, and into its subterranean galleries the sturdy ants carry the leaflets. These they use as a medium on which to grow a fungus in so-called nest gardens; the fungus in turn is used for food.

Luckily man has found little use for the ironwood tree. Some of its thoroughly dried wood is used for fuel about desert camps. Small pieces of well-cured wood have been used to make souvenirs, but for most purposes it is far too hard and tool-dulling for it to find favor among workers in wood. Many years ago I met a man near Mecca, California, who was getting out a half cord of well-cured wood for a piano manufacturer. He said he was to get two hundred dollars for the lot but con-



sidered himself rather poorly paid even in those days of low prices. What the wood was used for I have never found out. The Indians living in ironwood country are said to have formerly used the wood for arrow parts and tool handles.

The desert ironwood is evidently intolerant of any but small amounts of infrequent frost but highly tolerant of long-sustained high summer heat. It seems to be gregarious, if we may use this term in relation to plants, often growing in considerable colonies in the broad washes of the warmer parts of the Sonoran Desert Province. Its most frequent larger plant associates are palo verde, smoke tree, ocotillo, and the saguaro within that giant cactus' range.

How did the ironwood happen to have the scientific generic name, *Olneya*, attached to it? When in 1855 Asa Gray, America's all-time greatest botanist, was given the plant to describe, he decided to honor his respected friend, Stephen T. Olney, woolen manufacturer and botanist of Providence, Rhode Island. The specific name *tesota* is a Latinization of a Spanish-Indian name meaning stiff, firm, hard, durable.

END

Mistletoe gives the ironwood a strange appearance. ABOVE, LEFT: The large tumor on a dead ironwood is a particularly good example (author's photo). RIGHT: Mistletoe has virtually taken over this tree. (Don Ollis)

THE BEST WAY TO UNDERSTAND CHILE is to know each of its regions. Each has a distinct climate, topography, and economic development.

### Regions of Chile

A. THE DRY MINING DESERT. This northern region was described in Part 1 (see PD, November-December 1950, pages 4-12).



(Courtesy Grace Line)

B. SOUTHERN CHILE. From Chiloé southward is a second region of Chile. Southern Chile is the country's frontier; in it dwells only about 1 per cent of the total population. It is an unpleasant land, one of high winds and heavy rains.\* Much of the region consists of precipitous, rocky slopes and storm-tossed waters. The coastline is indented with fiords. The Valley falls away gradually and the Coast Range is transformed into an archipelago. The rivers here have steep gradients and some, though draining into the Pacific, have their headwaters on the eastern side of the Andes in Argentina. It is for the most part a region of extensive forests. The rainfall in places reaches 200 inches, and falls almost daily, especially in winter.

\*"For 900 miles the woods are so wet that it is impossible to set a fire for clearing without constant relighting, even when all the people of the countryside turn out to attempt it. In the southernmost islands the attempt would be quite hopeless." (Mark Jefferson, *The Rainfall of Chile*, American Geographical Society Research Series, No. 7, New York, 1921, p. 1.)

## CHILE

### C. LANGDON WHITE

There is little sunshine and there are few hours when the wind is not blowing.

Some of the world's most primitive tribes live in the southern tip of the region. They are fish-eaters and travel in canoes.

For centuries this was land to be avoided by most Chileans. Today it is a region of pioneering — a *frontera*. Raw towns are in the process of pushing back the wilderness. Most of the people in the region have come from the Island of Chiloé or the mainland near it. Colonization laws are for small to medium holdings, to be held by the families that live on the land.

About the only contact these pioneers have with the outside world is by means of the small government-owned freight and passenger steamers from Puerto Montt, which make trips twice each week.



(▲ R. Earl Storie ➤)

Hard-surfaced roads constitute the region's greatest single need. The dirt roads which now serve foot and vehicular traffic are impassable in winter, isolating communities one from another for more than six months each year. Like frontiersmen the world over, these people have little in the way of worldly goods. They live in log huts and travel mostly in boats. They are essentially self-sufficing, though there is some trading of timber, potatoes and fish for farm tools and cattle.

*Chile has modern cities (Concepción, above, is third largest) in its central part, small frontier farms (the one above is typical) to the south of the great Central Valley (its extreme southern end, to right).*

# nation with the long reach

**PART 2** Part 1 appeared in the November-December 1950 issue, and included a useful reference map of Chile.

The three chief economic activities are logging and lumbering, fishing, and sheep-raising. Recently petroleum has been discovered at Cerro Manantiales (Springhill) at the northern tip of Tierra del Fuego, but to date the field is unproductive.

**Logging and Lumbering.** South Chile along with the southern part of the Central Valley has a substantial forest. In fact, on a per capita basis Chile's commercial forest acreage is almost comparable with that of the United States. There are, however, in this forest some trees that have until recently been of little economic value. This was particularly true of the *coihue* — a very beautiful tree, but a species considered too heavy and weak for lumber and too wet to burn, but which now is supplying, along with the *Araucaria* pine, the material for a fast-growing plywood industry. The *alerce*, though scarce, is a very useful wood; one of America's largest conifers, some of the giants rise 200 feet in the air and have diameters of 6 feet. This tree is used in large quantities for shingles. Other useful trees are the *lingue*, used for furniture and floors, and the *roble*, used for railroad ties and fence posts, and the bark for tannin. The

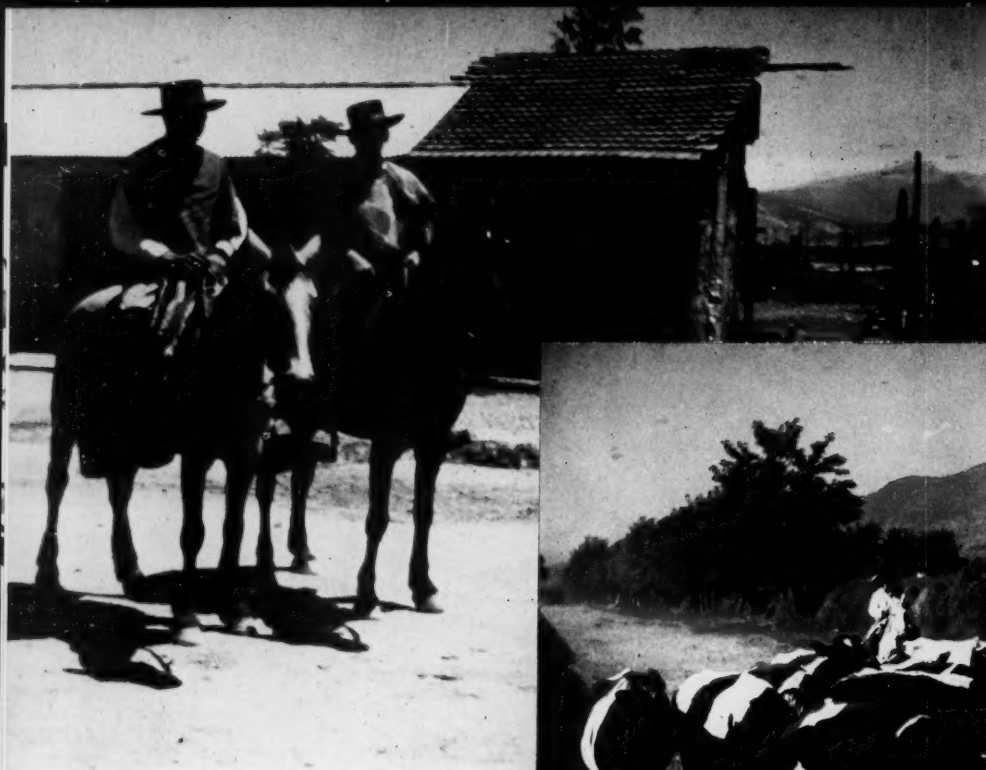
greater part of the forest activity is north of Puerto Montt — really outside this region.

With improved forest practice, it is believed that Chile's forests could sustain on a permanent basis an industry several times that now in operation.

**Fishing.** With its long coastline buttressed by the cold Humboldt Current, with waters teeming with some of the finest food fish in the world, Chile, particularly South Chile, is extremely fortunate in its possibilities for fishing. Yet its commercial fisheries are, so far, unimportant. While many settlements depend upon the sea for a living, only a small portion of the available fish supply is put to use. This results from (1) the lack of cold storage and refrigerated transportation, (2) the absence of modern commercial organization necessary for handling the distribution, and (3) the small market for fish in Chile. The Chileans eat only 11 pounds of fish per capita per year, compared with 50 in England, 75 in Norway, and 110 in Japan.\* The fact that these waters teem with some 200 species of edible fish indicates strongly that the fishing industry of South Chile could expand tremendously under favorable conditions. In fact Chilean fishermen could increase their catch

\*John W. White and Dorothy C. Benjamin, "Chile—Eden of Seafood," *Inter-American*, Vol. 4, September, 1945.

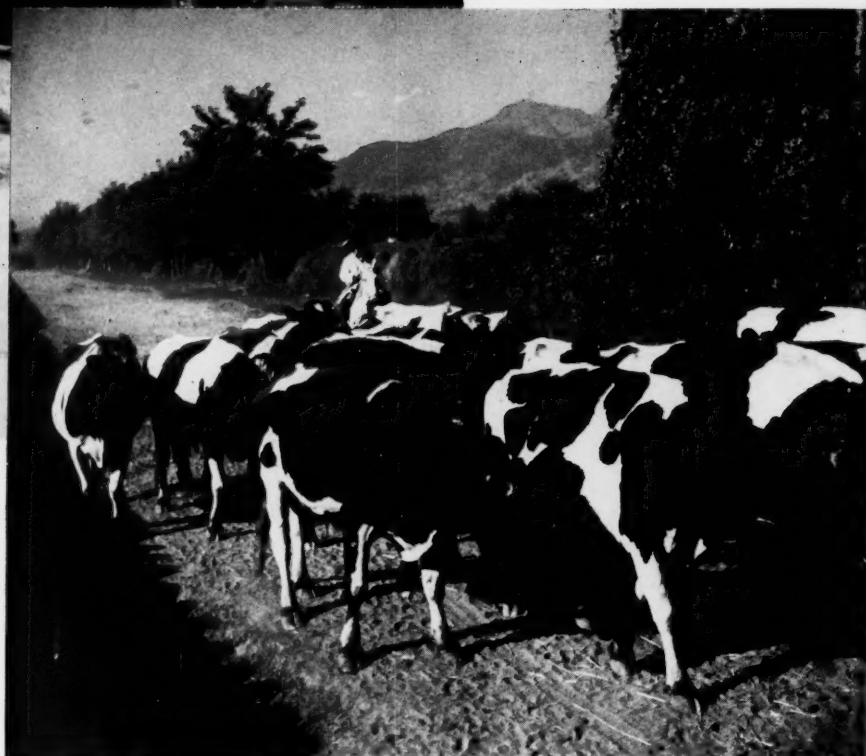




*Central Chile's similarity to early rather than modern California is emphasized by the oxen and two-wheeled carts which still do so much of the hauling. (R. Earl Storie)*

▲ *Chilean haciendas today look like California ranchos of a century ago. (R. Earl Storie)*

➤ *Holsteins are most popular with Chilean dairymen. This typical scene of the Central Valley is on La Hermida Hacienda. (Courtesy Grace Line)*



five or six times without additional equipment if a market were available. Quality oysters are procured from Ancud Bay of the Island of Chiloé, and fine lobsters (really giant crayfish) are brought to the cities from the Juan Fernandez or "Robinson Crusoe" Islands a few hundred miles off the coast from Valparaiso.

**Sheep-raising.** Most of Chile's sheep-raising takes place in this part of the country, and large sheep ranches lie on either side of the Strait of Magellan. Tierra del Fuego consists of a northern area of grassy plains and a southern area of forested snowcapped mountains. Chile has more than 6,000,000 sheep, and it is estimated that 60 per cent are in the two provinces of Aysen and Magallanes, and 43 per cent are in the latter alone. The grassy plains and stern climate of Magallanes are

singularly like those of northern Scotland. Here are some of the world's hugest sheep ranches. The largest of the companies maintains holdings larger than the Republic of Switzerland. These have been established and are managed by people from Scotland, England, Ireland, and Yugoslavia, and are worked by Chilean laborers. The principal ranches in Magallanes are privately owned, but those in Tierra del Fuego are on government land and the property is held under long lease. At Punta Arenas (Sandy Point), southernmost city in the world, are important packing plants, and the port is in large part sustained by the sheep industry. The city has a population of about 30,000 inhabitants. An important center prior to the completion of the Panama Canal, when nearly all shipping to the West Coast had to choose a route either





through the Strait of Magellan or around Cape Horn, it has definitely passed its zenith. Undoubtedly it would have become a "ghost town" had it not been for the sheep industry.

*Future of South Chile.* The future of South Chile is uncertain. The government is optimistic, claiming that millions of acres of good land, and soils and climate at least as good as those of Norway and Denmark are available. Most geographers, on the other hand, evince little optimism: they realize that the climate here is one of the world's worst; that the land area — level land — is limited (the foothills of the Andes extend right down to the ocean); that the soils are leached of much of their soluble minerals; that drainage is poor; and that only a limited number of crops find optimum or even good climatic conditions, because of the small amount of sunshine and the very cool summers. They believe that the physical obstacles are too great to sustain any considerable population on more than a low standard of living. They realize further that so far there has been little mineral exploitation, and that this situation is apt to continue for a long time because thick forest-cover buries most of the area and the popu-

lation is extremely sparse; both of these factors are deterrents to mineral discovery.

When one realizes that about half of the non-arable native pasture and range land of all Chile is located in the two provinces of Aysen and Magallanes, and that the region is terribly isolated (no highways or railways extend south of Middle Chile), it would appear that South Chile is not a land deserving of great expectations.

C. THE CENTRAL VALLEY: THE "REAL CHILE." The northern and southern regions have been described as Chilean mostly in the sense of possession; the "real Chile" — the Chile that counts — is the Central Valley, which reaches from La Serena to Puerto Montt, a distance of about 800 miles. Numerous rivers—most of Chile's rivers—rising in the snowfields of the Andes, flow across this region, supplying it with its life-blood, irrigation water. Yet only about 5 per cent of the land in the Central Valley is reached by irrigation. Moreover, only 8 per cent of the land of Chile is tillable and two-thirds of this 8 per cent is in the Central Valley. The natural environment is excellent for crops; hence the population, economic life, seat of government, culture, and principal cities all are

concentrated here. This is agricultural Chile; in fact there is little farming outside this area.

The Central Valley falls into three sub-regions: (1) North-central — Aconcagua to Maule provinces, inclusive; (2) South-central — Linares to Bío-Bío provinces, inclusive; (3) Southern — Malleco to Chiloé provinces, inclusive.

*Size of Farms and Systems of Farming.* Chilean farms are mostly huge; the largest ones are in the area tributary to Santiago or north of it.\* The number of small holdings, however, is increasing. This is particularly true in the southern part of the Central Valley, where the German influence is rather strong. This area proved unattractive to Spanish and Italian colonists.

Farming in the Central Valley is conducted on an extensive rather than an intensive scale. It is said that one-half of 1 per cent of the people own between 55 and 60 per cent of the farmland. About 90 per cent of the farms exceed 500 acres. Thus the country is still largely in the hands of comparatively few families.

Most of these estates had their beginnings in land grants in the Colonial Period, and many of them have been maintained almost intact in the same families to the present time. By far the greater part of the productive farm and pasture land of the country is included in the *haciendas*.

It is this problem of the big estate—*latifundia*—that is so serious in Chile and most everywhere else in Latin America. Since about 92 per cent of the total population lives in and close to the Central Valley, and since there is but a specific and definite amount of arable land and water, the only solution seems to be to break up the big estates into smaller units suitable for more intensive farming. One way of bringing this about is through increased taxation on the land — a necessity since the loss of the revenue from taxation on nitrate. The new tax is levied especially against land suitable for cultivation but not actually in production. Although it is true that the Chilean *hacendado* has been less rigid in his reaction to the land than the big landowners elsewhere throughout Latin America, nevertheless he moves slowly. His resistance to social reforms is understandable, for few persons are willing to surrender their individual advantages and privileges.

The Chilean farm laborers do not by and large have a happy life. The majority of these *inquilinos*

or resident tenants (semi-feudal farm laborers) are bound to the *haciendas* economically if not legally, and remain on the same land generation after generation. In 1937, in a study of 10,000 *inquilinos*, it was found that the average daily wage, including the plot of land, shelter and other benefits, as well as cash wage, ranged between 15 and 20 cents (U.S.). The situation is much better today, but it is doubtful whether, with the inflation which prevails, the *inquilino* is actually any better off. The low annual income provides families with an extremely low level of living. Some years ago, Mark Jefferson spoke of the *roto* as "landless, ignorant, wretched, and almost without hope." The government, however, is improving his situation. Moreover, strong currents of unrest are stirring. The occurrences in Russia and particularly in Mexico have not gone unheeded, and the average Chilean is opposed to a system that permits the existence of huge estates, the owners of which live in luxury and display flamboyant wealth, and simultaneously an underprivileged tenant class that exists under extreme poverty. Increasing numbers of farmers are moving into the cities. To these people who have been dependent upon shockingly low income, almost any city wage looks attractive.

The techniques employed in farming are to a very great extent antiquated, though the government is making a great effort to increase the use of farm machinery. In fact it is now planning to mechanize 1,200,000 acres.\* Descriptions of farming methods employed on *haciendas* 100 years ago still are apropos. Oxen rather than tractors supply most of the farm power, sickles rather than combines harvest wheat, and ox-drawn, two-wheeled carts rather than trucks still haul most of the farm products. It would be difficult to overemphasize the importance of oxen as sources of power where pulling is required. What mechanization there is, is found mostly in the south central and southern parts of the Central Valley because of the frequency of rains and the general fickleness of the weather. Taking care of crops on time is there essential, whereas to the north a delay of a few days is unimportant.

More land must be brought under irrigation.

\*The government, through one of its agencies, has recently purchased thousands of tractors, harvesters, plows and cultivators, and has organized the "Mechanized Agricultural Team Service" to make the new equipment available to as many farmers as possible.

\*The largest contains some 618 square miles.





At present only about 5 per cent of the land in this region is under the ditch, but it is estimated that 2,000,000 additional acres are susceptible to irrigation. This expansion, however, only is possible at great cost of construction: the topography of the valleys, with their paucity of flat land, makes irrigation expensive and difficult. Nevertheless, the Central Valley might with better land utilization support a population approximately equal to that of Italy (45,000,000). Even with her small population of some six million persons, Chile is an importer of food products—even of wheat, meat, and dairy products. The government is now developing new irrigation systems, using both surface and underground water.

About 36 per cent of the total gainfully employed population is engaged in agriculture. This indicates the strong position of farming, but it also indicates that the nation is in a transitional stage—toward more industrialization.

*Principal Crops.* Grain farming — primarily wheat farming — is the chief enterprise. Chile tries to be self-sufficient in wheat. Wheat, a winter crop in Chile, in part is irrigated, particularly in the north and south central zones. Yet it is difficult to grow wheat on irrigated land at prices that permit competition with wheat grown without irrigation in Argentina. The southern part of the Central

Valley is the chief wheat-producing area of Chile.

The growing of wine grapes also is a major enterprise. Grape-growing was introduced into Chile quite naturally, since both Spaniards and Italians cultivated the vine under almost identical climatic conditions in their home countries and are wine drinkers. In addition to grapes, nearly all fruits common to the Mediterranean Subtropical climate are grown.

Vegetables, too, comprise an important group of crops — beans, peas, lentils, chickpeas, and potatoes. Potatoes are grown mostly in the cooler and moister southern part of the Central Valley. In fact, Chile is considered by some plant explorers to be the original home of the potato; the crop grows wild in the southern lake region and on the Island of Chiloé.

Pastoral activities are important: cattle, sheep, and goats all are raised.

*Mining.* The Central Valley has some valuable mineral deposits and some important mines. At El Tofo near La Serena are outstanding iron ore mines, the only producing mines in the country.

Nearly all — in excess of 2,000,000 tons — of Chile's coal is mined in this region, largely at Lota in the Province of Arauco. The fields lie along the coast and some of the workings extend out under the Pacific for more than three miles.

A big copper mine — El Teniente — is located in the Andes in a part of this region.

*Manufacturing: Panacea for Chile's Economic Ills?* It is manufacturing rather than agriculture, stock-raising, or mining that in Chilean eyes appears to be the great hope of the future and "the only solution for war-dislocated economic and social conditions and rising living costs." To Chileans it means breaking the shackles of their semi-colonial status, whereby for generations they have traded raw materials for needed manufactures, a trade subject to the vagaries of wars, depressions, and tariffs.

Before 1929, Chile, exporting 30 to 40 per cent of her total production, was particularly vulnerable to depressed world economic conditions. In 1931 the nation defaulted on its foreign obligations. Continued economic deterioration brought extreme political instability. It is no exaggeration to say that the Chileans are now obsessed with the desire to industrialize.

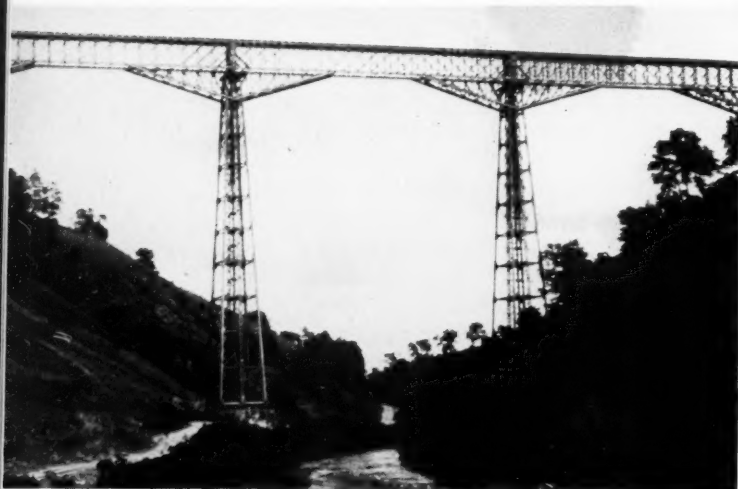
The fact should not be overlooked, however, that there are specific bases upon which efficient and profitable industrialization rests and that

wishful thinking — even a fiery determination — cannot alone produce economically successful manufacturing industries. Most South American countries, including Chile, are weak in these bases — nearly all lack a sufficient supply of cheap fuel of good quality, a large domestic market, abundance of raw materials, technical "know-how," and ample capital. Moreover, psychologically most of the people are not yet ready. They have been agricultural and pastoral in their economic interests, and among the cultured, educated, and well-to-do there has been a traditional aversion to business. Nevertheless, the population is increasing, which means expanded markets; sincere efforts are being made to raise the standard of living of the masses by developing a middle class; a business spirit is evolving, and revolutionary technological changes are encouraging industrialization.

While some consider that Chile is, by industrializing, diverting her energies into uneconomic channels and would be far better off economically to improve agriculture, it seems to the writer that in the long run, industry will become the principal means of raising the standards of living of the country as a whole.

Chile is determined that her own people must dominate the industrialization — that most of the profits must remain within the country and not be sluiced off to North America and Europe. Conversely, Chile recognizes that she lacks capital and technical "know-how" and, therefore, is at the moment willing to cooperate with foreign capital.

To date most of her industries produce consumer goods — cotton and rayon textiles, men's hats, shoes and leather goods, glassware, enamel ware, cement, plywood, soap, candles, beverages, tobacco products, flour, sugar, furniture. On the



About  
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whole, food products, beverages, and tobacco products are the most important, followed by textiles.

Most of the manufacturing is concentrated in the Central Valley, more than three-fourths of it in four cities — Santiago, Valparaíso, Concepción, and Valdivia. This is in line with the industrial structure throughout all Latin America. Concentration invariably is greatest in the capital city, a few major ports, or in cities at a relatively short distance from tidewater. This is a response to markets, labor, power, and transportation.

Chile is not willing to make consumer goods only. She wants a heavy industry also — including iron and steel.

Viewed from cold economics and economic geography, perhaps Chile ought not to make her own iron and steel. In all probability she could purchase her steel ton for ton more economically from abroad. It seems inconceivable to the writer that Chile could compete even in her own market against Belgium, for instance, without a very high protective tariff. But two world wars and a depression, during which Chile could get little or no steel, left their mark on the people. Never again do they want to have to depend on the outside world for such indispensable products as iron and steel. The new steel plant has been constructed at Huachipato, near Concepción. This location was chosen because it seemed the best relative to all the major factors affecting the location of a modern steel industry.

#### Summary and Conclusion

It has been pointed out that Chile is a land of contrasts — a land of desert (northern Chile), of heavy rain (southern Chile), and of pleasant living (Central Valley); that it is a land of modern industrial cities and of primitive agricultural communities; of culture and sophistication and of rude pioneering; of flamboyant wealth and of biting poverty. We have noted that Chile's economy has been quite unstable in the past because she relied too heavily on exports of nitrate and copper, both of which are subject to variable demand; in fact, as late as 1950 she suffered economically because of the fall in price of three of her major exports — copper, nitrate, and iodine. Hence she is seeking greater diversity and is rapidly transforming herself from a nation with a colonial economy to one with an independent economy. Nothing is more needed to raise the standard of living.

It was shown that Chile has been and still is a land of *latifundia* — where nearly all the good agricultural land is held by a relatively small number of families, but that this system is slowly breaking down and that a modernized agriculture, including the use of much more machinery, is in process of development.

Chile's desire to industrialize has been indicated and it was shown that in terms of number of establishments, employment, investment, and value of products, the nation shares industrial leadership with Argentina, Brazil, and Mexico throughout all Latin America. Chile's industrial position is far superior to what the statistics imply. Chile indisputably is a well-balanced nation, probably the best example in South America. Possibly Chile will attain a greater degree of self-sufficiency than any South American country other than Brazil. Her future, however, must see a fuller utilization (greater production) of the rich agricultural lands in the Central Valley and a greater development of the natural resources in South Chile.

It has been pointed out that Chile is pinned to the Pacific; hence waterborne transportation predominates over that of land and air. Transportation, however, is less of a problem in Chile than in most of the other South American countries. This results from the shape of the country, largely, and from the fact that all of it lies west of the Andes. Hence all centers of population are on or relatively near the coast. The railways extend from Pisagua on the north to Puerto Montt on the south, with feeders connecting with the ports.

Chile has some 30,000 miles of highway, but most of this — three-fifths — consists of unimproved earth roads. Only about 500 miles are hard-surfaced. Approximately one-third of the highway mileage is reported to be impassable for motor vehicles during the rainy winter months.

Finally, it has been noted that Chile is the classical example of attenuation — *of a nation with a long reach* — a country stretching for 2,600 miles in length but averaging only 110 in width, and that accordingly it is not governed easily, efficiently, or economically from the central seat of government; that federal authorities in Santiago experience great difficulty in comprehending the many problems in the restrictive environments of the northern and southern extremities, and that legislation has long been essentially for the benefit of Central Chile.

END

About half of Chile's rail mileage is in the Longitudinal Railway which extends from Pisagua in the north to Puerto Montt (pictured here) in the south. The bridge is over the Río Malleco. (R. Earl Storie)

**THE INCOMPARABLE VALLEY: A GEOLOGIC INTERPRETATION OF THE YOSEMITE.** By François E. Matthes. Edited by Fritiof Fryxell. University of California Press, Berkeley. 1950. xv + 160 pp., 50 photographs, including 24 by Ansel Adams, 11 figures. \$3.75.

**SEQUOIA NATIONAL PARK: A GEOLOGICAL ALBUM.** By François E. Matthes. Edited by Fritiof Fryxell. University of California Press, Berkeley. 1950. x + 136 pp., 115 photographs, 9 figures, 1 map, glossary. \$3.75.

In 1930 Dr. François E. Matthes completed his monumental work, *Geologic History of the Yosemite Valley*. By glaciologists the world over this volume was considered authoritative summation of the many studies that had previously been made of the geomorphology of the Yosemite. Although a technical and scientific work, it proved easy reading for the amateur geologist. Now out of print, it has become a collector's item. Those who do not possess the original volume will welcome the opportunity of acquiring the condensed version in *The Incomparable Valley: a Geologic Interpretation of the Yosemite*.

When he had completed his work in the Yosemite, Dr. Matthes undertook the study of the Kern River Basin and the Sequoia National Park. This was never completed as he was called to Washington during World War II and died in 1948. His notes and annotated photographs of this region form the basis for a companion book entitled *Sequoia National Park: a Geological Album*.

As editor of the two books, Dr. Fritiof Fryxell, himself an author, mountaineer, and geologist, has retained, as far as possible, Dr. Matthes' original text. It would be difficult to improve on his simple, clean-cut but descriptive language. While some of the technical material contained in the early Yosemite volume has been eliminated in the shorter work, the continuity has been perfectly preserved and the intensity of interest, so characteristic of the author, well sustained. Selections of Dr. Matthes' more recent writings from *Sierra Nevada: The Range of Light* have been used to advantage in building up a clearer approach to the problem and other recent findings have been included to carry the theme forward.

In order to give us a better perspective of the development of Yosemite's spectacular canyon with its precipitous cliffs, domes, and high waterfalls, he carries us back sixty million years when these rugged mountains were low rolling hills and valleys. Then, by a series of vivid pictures, he brings us, step by step, down to our own times. He presents his evidence so logically and so convincingly that, unconsciously, one wonders at the inability of former scientists to solve the mystery of Yosemite's genesis and evolution.

Dr. Matthes is not the type who pontificates. He has the rare faculty of apparently allowing each geological feature to plead its own cause and present its own evidence. Thus, we gain new respect for El Capitan as we follow its evolution from a low rounded knoll to a high sloping mountain and finally into the greatest and boldest monolithic monument in the world. Similarly, we gain added admiration for Bridal Veil and Yosemite Falls as we follow them first as small meandering streams, then as turbulent cascading rivers and finally, as they leap from their high hanging valleys, among the most beautiful and highest on earth.

One feels as though on a conducted tour with this world famous geologist personally pointing out the whys and wherefores of each steep gully and rough mound of rocks, or polished buttress and weathered boulder. Deep blue lakes nestling in stair-like canyon beds take on new significance. It is from him that we begin to understand why tall slivers of granite like the Cathedral Spires have persisted so long against the shattered walls at their backs. Tenaya Canyon and Half Dome lose the aura of mystery as we learn of the forces that shaped them.

So thoroughly and fundamentally does Dr. Matthes impart his lessons, that the knowledge we gain here about Yosemite carries over into other regions of the Sierra. As a natural sequence, this book prepares us for a fuller appreciation of the companion volume on the Sequoia National Park.

In the latter we learn, with a newly acquired facility, to analyze the various features in the complex system of watersheds which make up this vast park, extending from the valley foothills to the highest point in the United States. This is accomplished through the medium of 124 well selected photographs and sketches, each accompanied by a descriptive paragraph.

Dr. Matthes is at his best in those portions devoted to the Kern River Basin, about which so little has been written along popular lines. He clearly brings out the relation between the various benches and plateaus making up this great basin and the different epochs of the tertiary period. An excellent glossary of geological terms is added to help us understand some of the unusual names used in the descriptions.

The text in both books is written with the clarity and vividness of a historical romance, but with the accuracy and thoroughness of a scientific treatise. Both are musts for anyone who would know and love his mountains better. Before a trip, they prepare us for the scenic wonders of our high country and can aid us in the selection of our itineraries. On the trip, they should be daily companions and guides to introduce us to new features and answer many of our most naïve questions. Back again by our firesides, they can furnish us with further adventure by renewing memories of the many thrilling incidents of the vacation.



In anticipation of further editions (and there is little doubt in my mind that there will be need of them) it might be well for the editor to check further on some of the pictures in the Sequoia volume. We suggest the following changes which could be corrected by those now having the books: in figure 11, the "cairn" referred to happens to be the most northerly of three summit masses, about 15 feet high and 40 feet long. In figure 20, the "erosion surface" at the extreme left is the same as that at the extreme left of figure 25, yet in one case it is placed in the Cirque Peak and in the other as approaching the Whitney erosion stage. Personally I favor the former as it happens to be the southwest slope of the Pickering massif and not much over 12,000 feet.

The view in figure 21 is toward the northwest, with Mt. Guyot on the immediate skyline, and in the hazy background, possibly the Great Western Divide, but certainly not the Sierra Crest. In figures 24 and 69, could not the vestiges of Cirque Peak erosion really apply to Junction Pass rather than to Junction Peak? The summit of the latter is a sharp pyramid (barely able to accommodate a half dozen climbers). The peak falls away sharply in all directions, with one broader but extremely steep shoulder sloping down toward Diamond Mesa.

In figure 27, Table Mountain is mislabeled, as will become evident by comparison with figure 70. Figure 32 is one of those unfortunate mistakes where the wrong title is attached to a picture. Pictured here is the basin of the headwaters of Rock Creek and not Kern River (some 20 miles distant). The mountain labeled Table is really Whitney.

I would like to agree with figure 68 in calling the range in the distance the Kings-Kern Divide, as in this location it does separate the Kings watershed from the Kern, but since the official topographical map disagrees with us, we had better get in step with it. In figure 81, Mt. Hale is actually at the extreme left of the picture rather than in the center. In figure 73, Mt. Carillon might claim the honor which belongs to Russell, as the R is over its summit rather than over the latter.

We remember well the pressure under which Dr. Matthes worked in finishing the Sequoia Albums and such slight mistakes could creep in readily. However, knowing how meticulous he was, we feel that he would welcome any suggestions that might be made in order that this may prove a lasting reference work and therefore as perfect as is humanly possible. We are looking forward to further publications by the University of California Press and Dr. Fryxell, derived from Dr. Matthes' notes. His writings should go down to posterity in permanent form.

OLIVER KEHRLEIN

San Francisco

MARCH-APRIL 1951

OUR DESERT NEIGHBORS. By Edmund C. Jaeger. Stanford University Press. 1950. x + 239 pp., 33 photographs; line drawings. \$5.00.

"The desert road we were following skirted a low rise, carried us across a broad, bumpy cross wash, and divided abruptly. Without hesitation we chose the fainter of the two trails and continued on our way . . ." Taking the faint trail with Edmund C. Jaeger in his new book, *Our Desert Neighbors*, leads to adventure in the desert and intimate acquaintance with foxes, coyotes, bighorn sheep, desert hares, kangaroo rats, pocket gophers, badgers, rock wrens, road runners, cactus woodpeckers, pinacate beetles, vinegaroons, chuckawallas, desert tortoises, and many more of the two-, four-, six-, and eight-legged inhabitants of this most irresistible part of our continent. Going along through the medium of type with the best of desert guides, you catch yourself saying, again and again, "How I'd like to go into the desert with this man!" To have been with him when he discovered the poorwill's secret of hibernation—a very recent and important ornithological discovery! The experience, and others he relates, are no less real, however, to the imagination, so surely does he have the knack of making you feel as though you *were* along with him.

This is more than very good reading; there is the satisfaction of learning a wealth of fascinating fact from a qualified, experienced observer of wildlife. The desert an-



Tallest of all  
trees—many are 350  
feet high—some  
are 2,000 years old.

## SAVE THE REDWOODS

Send 10 cents each for these attractively illustrated pamphlets: "A Living Link in History," by John C. Merriam. . . . "Trees, Shrubs and Flowers of the Redwood Region," by Willis L. Jepson. . . . "The Story Told by a Fallen Redwood," by Emanuel Fritz. . . . "Redwoods of the Past," by Ralph W. Chaney. All four pamphlets free to new members—send \$2 for annual membership (or \$10 for contributing membership).

### SAVE-THE-REDWOODS LEAGUE

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imals and plants have been his close neighbors for more than forty years.

The photographs are excellent and clearly reproduced; the chapter-head sketches have life and charm; and the Stanford University press has done throughout a clean, attractive job of printing and binding. Old Jaeger readers will welcome another desert book from him; new discoverers will be looking up his earlier titles before they finish this one. D.G.K.

**THE SMITHSONIAN: *America's Treasure House*.** By Webster Prentiss True. Sheridan House, New York. 1950. 306 pp., 123 photographs. \$3.50.

There is perhaps no scientific institution better known by name to a great number of Americans than their own Smithsonian Institution, and that regardless of whether they have been there. The name itself has become a byword, a symbol of authority in the realm of scientific knowledge. Yet it may be ventured that relatively few who can be glib with the revered name could give more than the vaguest description of what it actually stands for, to say nothing of how it originated. The story is romantic, and every American should be familiar with it.

In *The Smithsonian: America's Treasure House*, the chief of the Institution's editorial division, Webster Prentiss True, gives a full-length, highlighted portrait of the world-encompassing establishment that started modestly

a century ago on Washington's Mall from the half-million-dollar bequest of a lonely Englishman. Appropriately, James Smithson himself is subject of the first chapter. As the picture develops through the fourteen chapters, we may call it impressionistic—the spots of color that make up the whole being selected details, picked for their appeal to the popular imagination. Through this familiar method, highly suitable to the subject, we gain a rounded picture of each of the Institution's ten bureaus and learn at the same time an astonishing array of interesting facts about nearly everything under the sun that comes under the Smithsonian eye, including the sun itself—how many of us know that the Smithsonian maintains a solar radiation observatory deep in a tunnel near the top of a remote peak in the Chilean Andes?

Of great value to many will be the 123 photographs. You will find, if you want it, Parícutin erupting, a *Stegosaurus*, the Kensington Stone (and a cast of the Rosetta Stone), the John Bull Locomotive and the 1898 Winton, Washington's uniform (and Mrs. W.'s dress), the Wright brothers' plane, sunspots, shrunken heads (authentic Jivaro), Emperor penguins, Raphael's "Alba Madonna," and 110 other familiar and unfamiliar items.

Whatever your special interest, you will put this absorbing book down knowing what your Smithsonian is, how it operates, and how important it is to you and the whole world—and you will be proud to be part owner of it and its treasure of science, history and art. D.G.K.

## *Audubon Camp of California* —

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For Reservations and Illustrated Folder #D-1,

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887 Indian Rock Avenue

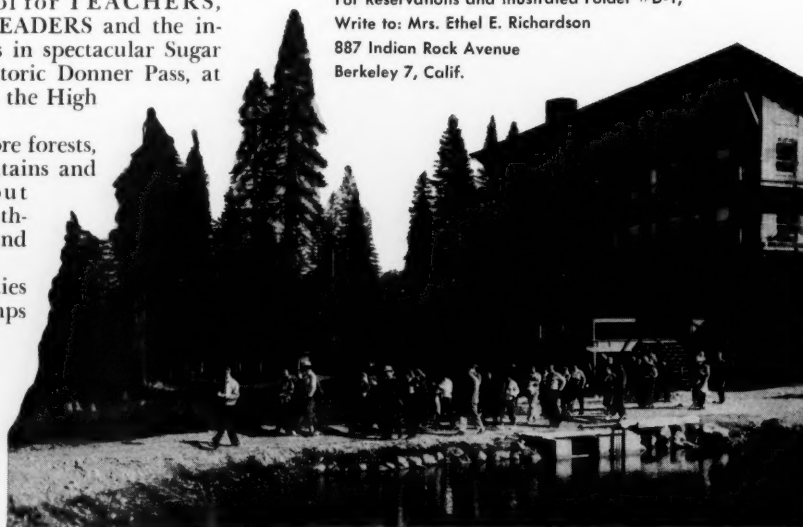
Berkeley 7, Calif.

This outdoor school for **TEACHERS, OTHER YOUTH LEADERS** and the interested **LAYMAN**, is in spectacular Sugar Bowl Valley near historic Donner Pass, at 7000 feet elevation in the High Sierra.

Here students explore forests, streams, ponds, mountains and deserts; learn about rocks, soil, water, weather, plants, animals and stars.

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## I'd Like to Know...

You may have heard that a suit has been filed by the Antitrust Division in Washington to break up Standard of California as well as six other West Coast oil companies. Hundreds of people have already written us protesting this action and many have asked pertinent questions. We believe these questions should be answered for everyone. And we take this way of doing so. If you have a question we urge you to write:

"I'D LIKE TO KNOW"

225 Bush Street, San Francisco 20

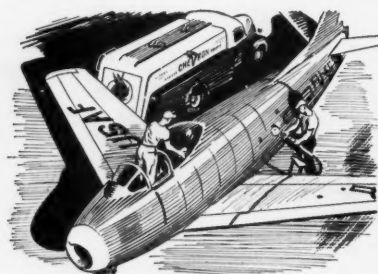


## "Would breaking up big oil companies affect national defense?"

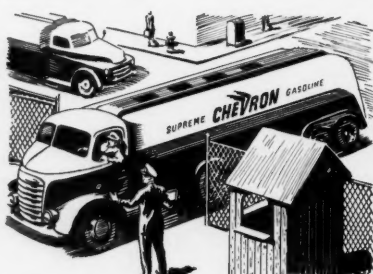
**Mrs. Marie-Louise Auer, Pasadena housewife, writes:** *"It seems to me like a bad time to be tampering with our industries, as the antitrust lawyers want to do. Or does it matter? Would breaking up big oil companies affect national defense?"* Mrs. Marie-Louise Auer.

Here at Standard, one of the seven Western oil companies under attack, we see clear public benefit in having big companies in the

business at all times. We believe we serve you well. But let's consider now just "bigness" and national defense:



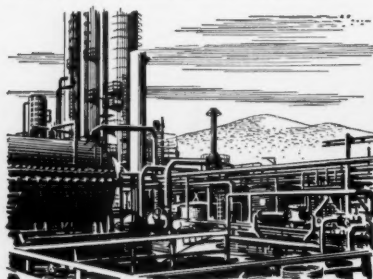
Of course, in time of crisis, military needs get first call. One example: aviation gasolines. In the last six months of 1950, in the West alone, these needs jumped 275%. Big oil companies supplied it.



Second obvious demand comes from industry. Has anyone forgotten how much America's strength during World War II depended on industrial production? It takes big companies to supply big needs.



Another direct result of company bigness is product improvement. Big companies do research on a big scale. Example: the Standard-developed oils which increased U. S. submarines' range 300%.



The national government itself depends on our bigness and integration to handle hard jobs. Right now, Standard is operating a U. S. atomic research project and a U. S. synthetic rubber plant.



Indirect but important defense contribution is our big tax payments. Last year our taxes were over \$95,000,000. As one big company, we pay more taxes than we would as several smaller companies.



And while all this is going on, Standard's bigness and integration enable us to keep on producing, refining, transporting and delivering products to you. Isn't this what you want from your oil company?

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• plans ahead to serve you better



